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ABSTRACT

With this Career and Technology Studies (CTS) curriculum guide, secondary students in Alberta can do the following: develop skills that can be applied in their daily lives; refine career-planning skills; develop technology-related skills in design; enhance employability skills, especially in design occupations; and apply and reinforce learning developed in other subject areas. The curriculum is organized in strands and modules. This guide encompassing the design studies strand contains 31 modules that define what a student is expected to know and be able to do (competencies). The guide is organized in the following parts: (1) program rationale and philosophy, learner expectations, program organization, curriculum and assessment standards, and types of competencies in design studies; (2) strand rationale and philosophy and strand organization for design studies; (3) planning for instruction for career and technology studies and for design courses; (4) module curriculum and assessment standards for introductory level design competencies; (5) module curriculum and assessment standards for intermediate level design competencies; (6) module curriculum and assessment standards for advanced level design competencies; (7) assessment tools; (8) linkages and transitions; (9) learning resource guide; and (10) sample student learning guides. Modules cover the following broad topics: sketching/drawing/modeling; 2-D and 3-D design fundamentals and applications; computer-aided design (CAD); drafting; technical drawing; living environment; CAD modeling; the evolution of design; the design profession; and portfolio presentation. (KC)

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ED 411 411

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

GUIDE TO STANDARDS AND IMPLEMENTATION

1997

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This document supersedes all previous versions of the *Career & Technology Studies Guide to Standards and Implementation*.

This publication is a support document. The advice and direction offered is suggestive except where it duplicates the Program of Studies. The Program of Studies—a prescriptive description of the expectations of student learning, focusing on what students are expected to know and be able to do—is issued under the authority of the Minister of Education pursuant to section 25(1) of the *School Act*, Statutes of Alberta, 1988, Chapter S–3.1 as amended, and is required for implementation. Within this document, the Program of Studies is shaded so that the reader may readily identify all prescriptive statements or segments.

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CAREER AND TECHNOLOGY STUDIES

A. PROGRAM RATIONALE AND PHILOSOPHY

Through Career and Technology Studies (CTS), secondary education in Alberta is responding to the many challenges of modern society, helping young people develop daily living skills and nurturing a flexible, well-qualified work force.

In Canada's information society, characterized by rapid change in the social and economic environment, students must be confident in their ability to respond to change and successfully meet the challenges they face in their own personal and work lives. In particular, they make decisions about what they will do when they finish high school. Many students will enter the work force, others will continue their education. All students face the challenges of growing independence and responsibility, and of entering post-secondary programs and/or the highly competitive workplace.

Secondary schools also face challenges. They must deliver, on a consistent basis, high quality, cost-effective programs that students, parents and the community find credible and relevant.

CTS helps schools and students meet these challenges. Schools can respond more efficiently and effectively to student and community needs and expectations by taking advantage of the opportunities in the CTS curriculum to design courses and access school, community and distance learning resources. Students can develop the confidence they need as they move into adult roles by assuming increased responsibility for their learning; cultivating their individual talents, interests and abilities; and by defining and acting on their goals.

As an important component of education in Alberta secondary schools, CTS promotes student achievement by setting clear expectations and recognizing student success. Students in CTS develop competencies—the knowledge, skills and attitudes they are expected to demonstrate, that is, what they know and what they are able to do.

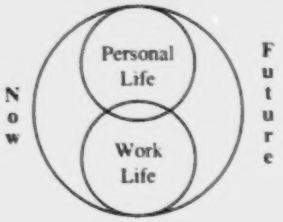
Acquired competencies can be applied now and in the future as students make a smooth transition into adult roles in the family, community, workplace and/or further education. To facilitate this transition, clearly stated expectations and standards have been defined in cooperation with teachers, business and industry representatives and post-secondary educators.

CTS offers all students important learning opportunities. Regardless of the particular area of study chosen, ***students*** in CTS ***will***:

- develop skills that can be applied in their daily lives, now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

In CTS, students build skills they can apply in their everyday lives. For example, in the CTS program, particularly at the introductory levels, students have the opportunity to improve their ability to make sound consumer decisions and to appreciate environmental and safety precautions.

CAREERS



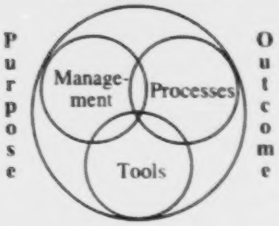
A career encompasses more than activities just related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen of the world.

The integration of careers throughout the CTS program helps students to make effective career decisions and to target their efforts. CTS students will have the opportunity to expand their knowledge about careers, occupations and job opportunities, as well as the education and/or training requirements involved. Also, students come to recognize the need for lifelong learning.

Students in CTS have the opportunity to use and apply technology and systems effectively and efficiently. This involves:

- a decision regarding which processes and procedures best suit the task at hand
- the appropriate selection and skilled use of the tools and/or resources available
- an assessment of and management of the impact the use of the technology may have on themselves, on others and on the environment.

TECHNOLOGY



Integrated throughout CTS are employability skills, those basic competencies that help students develop their personal management and social skills. Personal management skills are improved as students take increased responsibility for their learning, design innovative solutions to problems and challenges, and manage resources effectively and efficiently. Social skills improve through learning experiences that require students to work effectively with others, demonstrate teamwork and leadership, and maintain high standards in safety and accountability.

As well as honing employability skills, CTS reinforces and enhances learnings developed in core and other complementary courses. The curriculum emphasizes, as appropriate, the effective application of communication and numeracy skills.

In addition to the common outcomes described above, students focusing on a particular area of study will develop career-specific competencies that support entry into the workplace and/or related post-secondary programs. Career-specific competencies can involve understanding and applying appropriate terminology, processes and technologies related to a specific career, occupation or job.

GENERAL LEARNER EXPECTATIONS

General learner expectations describe the basic competencies integrated throughout the CTS program.

Within an applied context relevant to personal goals, aptitudes and abilities; *the student* in CTS *will*:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively to link and apply appropriate tools, management and processes to produce a desired outcome
- develop basic competencies (employability skills), by:
  - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing learning)
  - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing resources)
  - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (problem solving and innovation)
  - demonstrating appropriate written and verbal skills, such as composition, summarization and presentation (communicating effectively)
  - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (working with others)
  - maintaining high standards of ethics, diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility).

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into **strands** and **modules**.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors offering positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. Industry sectors encompass goods-producing industries, such as agriculture, manufacturing and construction; and service-producing industries, such as business, health, finance and insurance.

Modules are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Modules also specify prerequisites. Recommendations for module parameters, such as instructional qualifications, facilities and equipment can be found in the guides to implementation.

The competencies a student must demonstrate to achieve success in a module are defined through the *module learner expectations*. Senior high school students who can demonstrate the module learner expectations; i.e., who have the designated competencies, will qualify for one credit toward their high school diploma.

Specific learner expectations provide a more detailed framework for instruction. Within the context of module learner expectations, the specific learner expectations further define the knowledge, skills and attitudes the student should acquire.

The following chart shows the 22 strands that comprise the CTS program and the number of modules available in each strand.

Strand	No. of Modules
1. Agriculture	33
2. Career Transitions	28
3. Communication Technology	33
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology	58
7. Design Studies	31
8. Electro-Technologies	37
9. Energy and Mines	26
10. Enterprise and Innovation	8
11. Fabrication Studies	41
12. Fashion Studies	29
13. Financial Management	14
14. Foods	37
15. Forestry	21
16. Information Processing	48
17. Legal Studies	13
18. Logistics	12
19. Management and Marketing	19
20. Mechanics	54
21. Tourism Studies	24
22. Wildlife	17

LEVELS OF ACHIEVEMENT

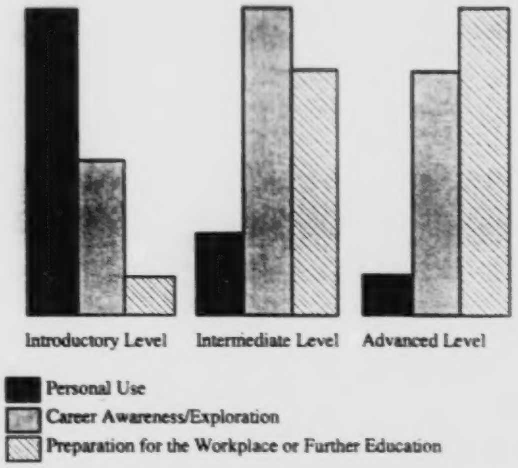
Modules are organized into three levels of achievement: **introductory**, **intermediate** and **advanced**. As students progress through the levels, they will be expected to meet higher standards and demonstrate an increased degree of competence, in both the general learner expectations and the module learner expectations.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are for students who have no previous experience in the strand.

Intermediate level modules build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Advanced level modules refine expertise and help prepare students for entry into the workplace or a related post-secondary program.

The graph below illustrates the relative emphasis on the aspects of career planning at each of the levels.



CURRICULUM AND ASSESSMENT STANDARDS

Curriculum standards in CTS define what students must know and be able to do. Curriculum standards are expressed through general learner expectations for CTS, and through module and specific learner expectations for each strand.

Assessment standards define how student performance is to be judged. In CTS, each assessment standard defines the conditions and criteria to be used for assessing the competencies of each module learner expectation. To receive credit for a module, students must demonstrate competency at the level specified by the conditions and criteria defined for each module learner expectation.

Students throughout the province receive a fair and reliable assessment as they use the standards to guide their efforts, thus ensuring they participate more effectively and successfully in the learning and assessment process. Standards at advanced levels are, as much as possible, linked to workplace and post-secondary entry-level requirements.

TYPES OF COMPETENCIES

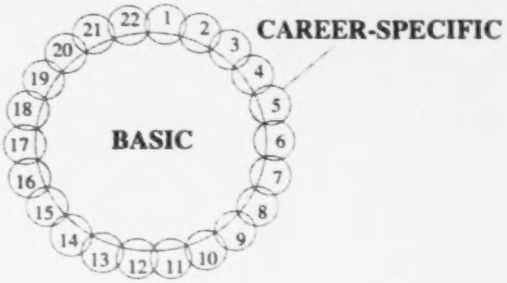
Two types of competencies are defined within the CTS program: basic and career-specific.

Basic competencies are generic to any career area and are developed within each module. Basic competencies include:

- personal management; e.g., managing learning, being innovative, ethics, managing resources
- social; e.g., communication, teamwork, leadership and service, demonstrating responsibility (safety and accountability).

Career-specific competencies relate to a particular strand. These competencies build daily living skills at the introductory levels and support the smooth transition to the workplace and/or post-secondary programs at the intermediate and advanced levels.

The model below shows the relationship of the two types of competencies within the 22 strands of the CTS program.



BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each module. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework*. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages**. Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Managing Learning			
☐ comes to class prepared for learning	☐ ——→——→	☐ ——→——→	☐ ——→——→
☐ follows basic instructions, as directed	☐ follows instructions, with limited direction	☐ follows detailed instructions on an independent basis	☐ ——→——→
	☐ sets goals and establishes steps to achieve them, with direction	☐ sets clear goals and establishes steps to achieve them	☐ demonstrates self-direction in learning, goal setting and goal achievement
☐ acquires specialized knowledge, skills and attitudes	☐ applies specialized knowledge, skills and attitudes in practical situations	☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations	☐ transfers and applies learning in new situations; demonstrates commitment to lifelong learning
☐ identifies criteria for evaluating choices and making decisions	☐ identifies and applies a range of effective strategies for solving problems and making decisions	☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions	☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions
☐ uses a variety of learning strategies	☐ explores and uses a variety of learning strategies, with limited direction	☐ selects and uses effective learning strategies	☐ ——→——→
		☐ cooperates with others in the effective use of learning strategies	☐ provides leadership in the effective use of learning strategies
Managing Resources			
☐ adheres to established timelines; uses time/schedules/planners effectively	☐ creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis
☐ uses information (material and human resources), as directed	☐ accesses and uses a range of relevant information (material and human resources), with limited direction	☐ accesses a range of information (material and human resources), and recognizes when additional resources are required	☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement
☐ uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service	☐ uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision	☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis	☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies)
☐ maintains, stores and/or disposes of equipment and materials, as directed	☐ maintains, stores and/or disposes of equipment and materials, with limited assistance	☐ maintains, stores and/or disposes of equipment and materials on an independent basis	☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation			
☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches	☐ identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints	☐ thinks critically and acts logically in the context of problem solving	☐ identifies and resolves problems efficiently and effectively
☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ applies problem-solving skills to a directed or a self-directed activity, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ transfers problem-solving skills to real-life situations, by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks	☐ identifies and suggests new ideas to get the job done creatively, by: – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Communicating Effectively			
☐ uses communication skills; e.g., reading, writing, illustrating, speaking	☐ communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means	☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments	☐ negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests
☐ uses language in appropriate context	☐ uses technical language appropriately	☐ encourages, persuades, convinces or otherwise motivates individuals	☐ negotiates and works toward a consensus
☐ listens to understand and learn	☐ listens and responds to understand and learn	☐ listens and responds to understand, learn and teach	☐ listens and responds to understand, learn, teach and evaluate
☐ demonstrates positive interpersonal skills in selected contexts	☐ demonstrates positive interpersonal skills in many contexts	☐ demonstrates positive interpersonal skills in most contexts	☐ promotes positive interpersonal skills among others
Working with Others			
☐ fulfills responsibility in a group project	☐ →	☐ seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload	☐ leads, where appropriate, mobilizing the group for high performance
☐ works collaboratively in structured situations with peer members	☐ cooperates to achieve group results	☐ works in a team or group: – encourages and supports team members – helps others in a positive manner – provides leadership/ followership as required – negotiates and works toward consensus as required	☐ understands and works within the context of the group
☐ acknowledges the opinions and contributions of others in the group	☐ maintains a balance between speaking, listening and responding in group discussions ☐ respects the feelings and views of others		☐ prepares, validates and implements plans that reveal new possibilities
Demonstrating Responsibility			
Attendance			
☐ demonstrates responsibility in attendance, punctuality and task completion	☐ →	☐ →	☐ →
Safety			
☐ follows personal and environmental health and safety procedures	☐ recognizes and follows personal and environmental health and safety procedures	☐ establishes and follows personal and environmental health and safety procedures	☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations
☐ identifies immediate hazards and their impact on self, others and the environment	☐ identifies immediate and potential hazards and their impact on self, others and the environment	☐ →	☐ →
☐ follows appropriate/emergency response procedures	☐ →	☐ →	☐ →
			☐ demonstrates accountability for actions taken to address immediate and potential hazards
Ethics			
☐ makes personal judgements about whether or not certain behaviours/actions are right or wrong	☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school	☐ assesses the implications of personal/group actions within the broader community; e.g., workplace	☐ analyzes the implications of personal/group actions within the global context ☐ states and defends a personal code of ethics as required

***Developmental Framework**			
• *Simple task* • *Structured environment* • *Directed learning*	• *Task with limited variables* • *Less structured environment* • *Limited direction*	• *Task with multiple variables* • *Flexible environment* • *Self-directed learning, seeking assistance as required*	• *Complex task* • *Open environment* • *Self-directed/self-motivated*

DESIGN STUDIES

B. STRAND RATIONALE AND PHILOSOPHY

Design is an integral part of our society. It permeates every facet of civilization, sometimes in complex ways, many times quite simply. Everyone designs every day. Design brings a sense of order to our world. Young children in play design physical structures, visual images and systems of organization. Professional designers create these and many other things. Signs, displays, packages, road systems, computer games, furniture, automobiles, clothing, banquets, houses and highrises are a few examples of work produced by professional designers.

Students may not become professional designers, but they still engage in design in some way. Design Studies, a strand in Career and Technology Studies, helps students become aware of design in their environment, engages them in designing, and shows them how design processes may be used in many contexts. Being aware of and appreciating the importance of design helps students become effective members of society.

Design can be described as a "creative problem-solving process, which begins with identifying a specific human need and results, ideally, in a product or situation that improves or enhances some aspect of our lives."* Design can be both a noun and a verb. As a noun, design can describe a condition, as in the statement ". . . your design shows creativity." As a verb, design suggests a process or problem-solving activity, as in the statement ". . . I need to design a container to carry water." Design Studies students work primarily in the context of design as a verb.

All students are expected to develop problem-solving skills through their school experience. Design Studies deals specifically with solving problems in a variety of contexts, and is limited only by facility or imagination. Design Studies students may be expected to solve visual problems, structural problems and organizational problems using the context of their environment, their other classes and their community experiences. This ability to solve problems will be applied by Design Studies students to situations in their daily lives, in their workplace activities and in post-secondary studies. The theoretical and practical learning of processes, tools and technologies used during Design Studies is relevant, because the learning occurs in context.

There are many reasons for students to engage in Design Studies. For example, students may wish to:

- develop and apply creative abilities and aesthetic awareness
- develop investigative and research skills

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* Definition taken from *What Is Design?* Edmonton, AB: Alberta Culture and Multiculturalism.

- develop problem-solving abilities
- develop the ability to select an appropriate medium, model a solution and effectively communicate the solution to others
- recognize the importance of design in the human environment, and its impact upon the natural environment
- appreciate the relationship between aesthetics, function, materials and processes
- become aware of the many factors that have to be taken into account in order to achieve appropriate and effective design solutions
- use appropriate technology to arrive at design solutions
- create innovative approaches, products and systems
- recognize significant historical events in design, and describe how they have influenced subsequent design developments
- be better able to pursue a design career.

Design may be studied in its own right or it may be incorporated into other curricula. Key features of Design Studies and other design-based programs are to:

- encourage and facilitate students to be creative, innovative and curious
- teach students to identify and solve many different kinds of design challenges
- incorporate student-directed learning
- teach teamwork strategies and skills
- apply theory within a context
- use technology appropriately and effectively
- teach safe and effective work practices
- appreciate appropriate attitudes, such as pursuing and valuing quality, ethics, professionalism, attention to detail and perseverance and understanding the discipline of design
- encourage cross-curricular links
- reach beyond the school to the community, to create links, projects and contacts with designers, local groups, professionals and businesses.

Within the philosophy of Career and Technology Studies, *students* in Design Studies *will*:

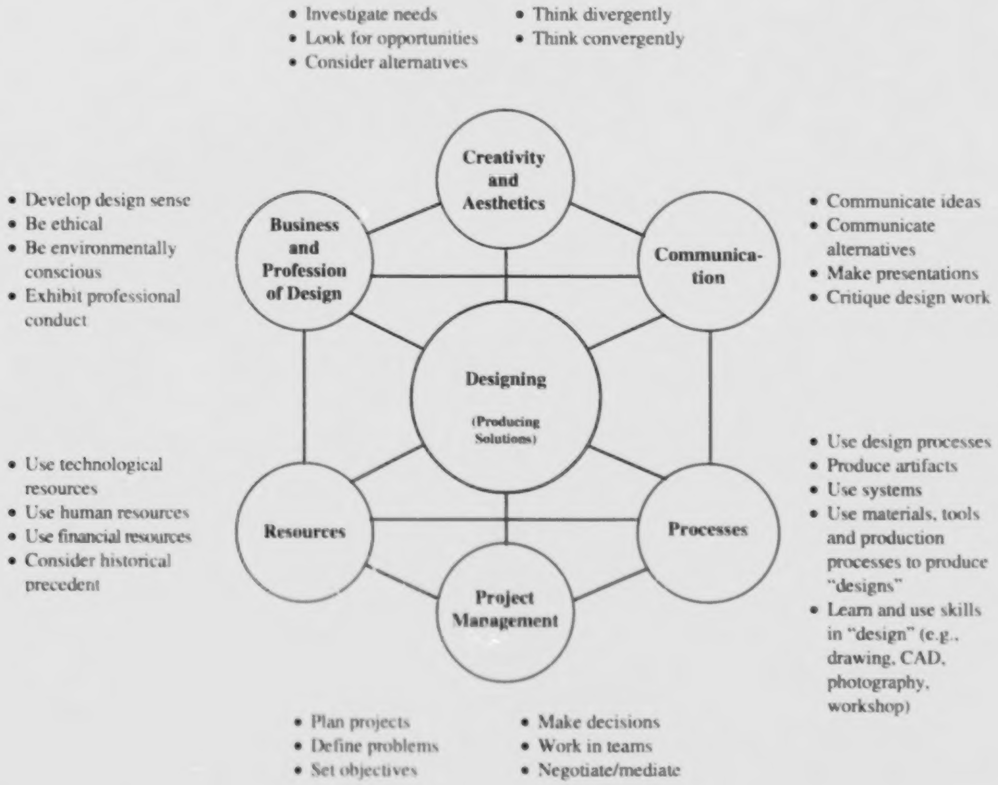
- demonstrate creativity and innovation
- demonstrate aesthetic awareness
- use historical research as one basis for design activity
- identify and solve problems
- work in two and three dimensions
- work individually and as members of a team
- recognize the value of technology, and use it appropriately and effectively
- demonstrate and practise safe and effective work habits and attitudes
- develop and apply personal and interpersonal, verbal and nonverbal communication and presentation skills
- develop the ability to recognize, appreciate and create appropriate design solutions
- appreciate that designers may confront ethical, legal and moral issues in their work
- appreciate that design has an impact upon the environment
- develop a working knowledge of tools, materials and processes associated with specific tasks
- develop and maintain a design journal
- develop and maintain a portfolio of design solutions.

STRAND ORGANIZATION

Design and Design Studies centre around the activity of problem solving within constraints. Design is complex, requiring the designer to simultaneously bring together numerous bits of knowledge, various processes and a variety of skills, and to use them together to address the task at hand. Design Studies focuses on six major areas:

- creativity and aesthetics
- processes
- resources
- communication
- project management
- business and profession of design.

The illustration below shows how these components interrelate.


• Investigate needs
• Look for opportunities
• Consider alternatives
• Think divergently
• Think convergently
Creativity and Aesthetics
Business and Profession of Design
• Develop design sense
• Be ethical
• Be environmentally conscious
• Exhibit professional conduct
Communication
• Communicate ideas
• Communicate alternatives
• Make presentations
• Critique design work
Designing
(Producing Solutions)
Resources
• Use technological resources
• Use human resources
• Use financial resources
• Consider historical precedent
Processes
• Use design processes
• Produce artifacts
• Use systems
• Use materials, tools and production processes to produce "designs"
• Learn and use skills in "design" (e.g., drawing, CAD, photography, workshop)
Project Management
• Plan projects
• Define problems
• Set objectives
• Make decisions
• Work in teams
• Negotiate/mediate

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THEMES

Modules in Design Studies are divided into three themes. Each theme is based on commonalities within the topics covered by the modules within the themes. While these are convenient groupings, they should not be seen as exclusive, because the modules from all themes complement each other. The three Design Studies themes are:

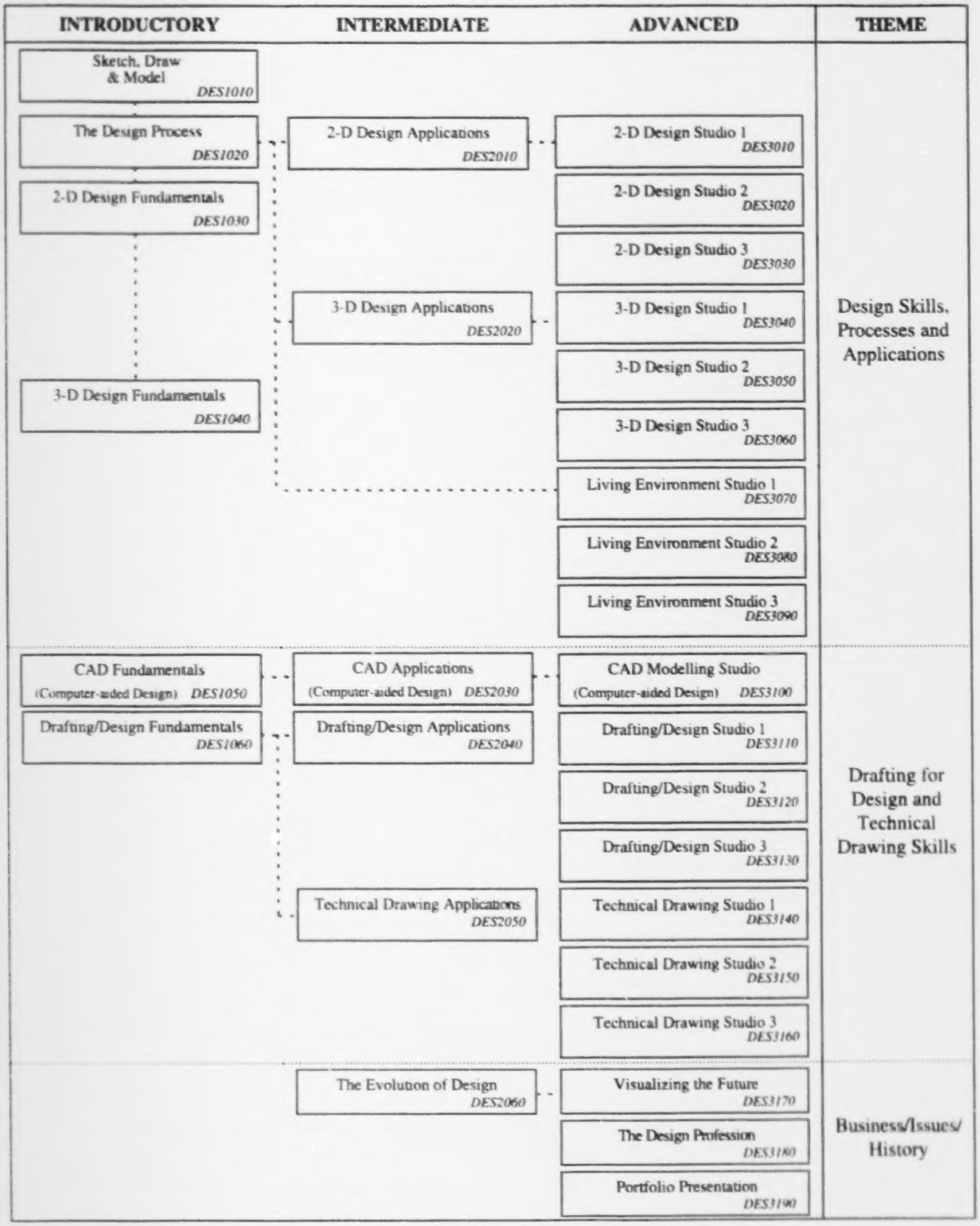
- design skills, processes and applications
- drafting for design and technical drawing skills
- business/issues/history.

CONCEPTS

There are four common concept areas dealt with in Design Studies. Some are found in all modules while others relate most appropriately to specific modules. For example, design skills are more relevant in skills-based modules. The elements and principles of design and applied problem solving are emphasized in process-based modules. The need to present work and/or information and maintain a design journal and portfolio is required in all modules.

The four concepts in Design Studies are:

- skills development
- elements and principles of design
- applied problem solving
- presentation, design journal and portfolio.



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Sketch, Draw & Model *DES1010*			Design Skills, Processes and Applications
The Design Process *DES1020*	2-D Design Applications *DES2010*	2-D Design Studio 1 *DES3010*	
2-D Design Fundamentals *DES1030*		2-D Design Studio 2 *DES3020*	
		2-D Design Studio 3 *DES3030*	
	3-D Design Applications *DES2020*	3-D Design Studio 1 *DES3040*	
		3-D Design Studio 2 *DES3050*	
3-D Design Fundamentals *DES1040*		3-D Design Studio 3 *DES3060*	
		Living Environment Studio 1 *DES3070*	
		Living Environment Studio 2 *DES3080*	
		Living Environment Studio 3 *DES3090*	
CAD Fundamentals (Computer-aided Design) *DES1050*	CAD Applications (Computer-aided Design) *DES2030*	CAD Modelling Studio (Computer-aided Design) *DES3100*	Drafting for Design and Technical Drawing Skills
Drafting/Design Fundamentals *DES1060*	Drafting/Design Applications *DES2040*	Drafting/Design Studio 1 *DES3110*	
		Drafting/Design Studio 2 *DES3120*	
		Drafting/Design Studio 3 *DES3130*	
	Technical Drawing Applications *DES2050*	Technical Drawing Studio 1 *DES3140*	
		Technical Drawing Studio 2 *DES3150*	
		Technical Drawing Studio 3 *DES3160*	
	The Evolution of Design *DES2060*	Visualizing the Future *DES3170*	Business/Issues/ History
		The Design Profession *DES3180*	
		Portfolio Presentation *DES3190*	

—— Prerequisite - - - - Recommended sequence

MODULE DESCRIPTIONS

Module DES1010: Sketch, Draw & Model
Students are introduced to observational sketching and drawing, and modelling, and to a selection of materials and tools and their uses. Students also develop skills that can be used and enhanced in further design activity.

Module DES1020: The Design Process
Students begin this process-based activity by developing an understanding of the problem through research. They then develop possible solutions, working through them to arrive at a final, appropriate solution.

Module DES1030: 2-D Design Fundamentals
Students develop skills and techniques appropriate to two-dimensional design by engaging in a variety of activities in various contexts. Techniques may include drawing, layout, use of tools and equipment appropriate for two-dimensional design, cutting, joining, measuring and use of notations.

Module DES1040: 3-D Design Fundamentals
Students develop skills and techniques appropriate to three-dimensional design, by engaging in a variety of activities in various contexts. Techniques may include drawing, modelling, use of tools and equipment appropriate to three-dimensional design, cutting, joining, measuring and use of notations.

Module DES1050: CAD Fundamentals (Computer-aided Design)
Students develop basic knowledge and skills in computer-aided design (CAD).

Module DES1060: Drafting/Design Fundamentals
Students develop basic knowledge, skills and techniques to draft appropriate drawings for visualizing and illustrating simple design problems.

Module DES2010: 2-D Design Applications
Students apply the design process and other knowledge, skills and processes learned at the introductory level to two-dimensional design projects. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module DES2020: 3-D Design Applications
Students apply the design process and other knowledge, skills and processes learned at the introductory level to three-dimensional design projects. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module DES2030: CAD Applications (Computer-aided Design)
Students apply their previous learnings, and add knowledge, skills and techniques associated with computer-aided design (CAD) to the context of new design-related tasks.

Module DES2040: Drafting/Design Applications
Students learn skills in assembly, section and/or auxiliary drawing. They further develop the knowledge, skills and techniques; e.g., pictorial drawings, multiview drawings, surface developments (flat patterns), and by applying them in the context of more complex design projects.

Module DES2050: Technical Drawing Applications
Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Module DES2060: The Evolution of Design
Students develop a historical framework for the importance and relevance of design within a cultural context, by examining past and contemporary examples of designed artifacts.

Module DES3010: 2-D Design Studio 1
Students apply theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics of communication design solutions.

Module DES3020: 2-D Design Studio 2
Students investigate the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and apply this information when resolving complex communication design problems.

Module DES3030: 2-D Design Studio 3
Students explore the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied in the resolution of complex two-dimensional design problems.

Module DES3040: 3-D Design Studio 1
Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

Module DES3050: 3-D Design Studio 2
Students are introduced to human factors, principles and considerations; e.g., ergonomics, semantics and semiotics.

Module DES3060: 3-D Design Studio 3
Students expand their knowledge of materials, technologies and production/processes employed to shape and join materials and assemble products. Students will become familiar with principles of manufacturing, and materials, technologies and processes appropriate to manufacturing a product in various production quantities.

Module DES3070: Living Environment Studio 1
Students learn to develop appropriate architectural, environmental or interior design solutions for specific human needs. Students also learn to use design methodology and teamwork in the development of such solutions.

Module DES3080: Living Environment Studio 2
Students learn to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. They assess solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

Module DES3090: Living Environment Studio 3
Students develop design solutions specific to architectural, environmental or interior design and learn about using and/or specifying appropriate materials and production processes.

Module DES3100: CAD Modelling Studio (Computer-aided Design)
Students solve design problems, using advanced computer-aided design (CAD) methods, advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

Module DES3110: Drafting/Design Studio 1
Students concentrate on various drawing and drafting types to illustrate design concepts and solutions, including freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing.

Module DES3120: Drafting/Design Studio 2
Students develop complex explanatory drawings from base (line) drawings, that may include exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. This is a skill-building module with the emphasis on explanatory line drawings.

Module DES3130: Drafting/Design Studio 3
Students apply rendering techniques to line drawings (base or developed), concentrating on light, colour and various media; e.g., coloured pencils, marker pens, water colours, computer rendered. Presentation techniques are used to compose high quality illustrations to communicate design solution, such as rendered drawings, context backgrounds, collage and montage techniques, titles, text.

Module DES3140: Technical Drawing Studio 1
Students produce sections, elevations and auxiliary drawings, and build upon their learnings from the intermediate level. Students may use previously produced sketches and multiview drawings as a basis for further work.

Module DES3150: Technical Drawing Studio 2
Students identify and specify details of various product components with a focus on representations of developments; e.g., sheet metal flashing, clothing patterns, and on intersections; e.g., the intersection of two heating ducts.

Module DES3160: Technical Drawing Studio 3
Students diagram and illustrate the design specifications for a product, structure and/or process as a basis for fabrication, manufacturing and/or construction. They complete a set of working drawings for a self-generated or teacher-specified designed item.

Module DES3170: Visualizing the Future
Students explore new possibilities in design, including the role of the designer and the challenges that are faced by the designers.

Module DES3180: The Design Profession
Students develop an understanding of the business aspect of the design profession, including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may also be explored.

Module DES3190: Portfolio Presentation
Students prepare a presentation portfolio for a specific purpose, such as entry into the workplace or a post-secondary institution.

SECTION C: PLANNING FOR INSTRUCTION

CTS provides increased opportunity for junior and senior high schools to design courses based on the needs and interests of their students and the circumstances within the school and community. Some strands may be appropriately introduced at the junior high school level. Other strands are more appropriately introduced at the senior high school level or to Grade 9 students. Refer to this section for recommendations regarding the Design Studies strand, or the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* for a summary of the recommended grade levels for each strand.

PLANNING FOR CTS

Defining Courses

Schools determine which strands and modules will be offered in a particular school, and will combine modules into courses.

Each module was designed for approximately 25 hours of instruction. However, this time frame is only a guideline to facilitate planning. The CTS curricula are competency based, and the student may take more or less time to gain the designated competencies within each module.

A course will usually consist of modules primarily from the same strand but, where appropriate, may include modules from other CTS strands. Refer to the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* (Appendix 4) for more information on course names and course codes.

Module selection and sequencing should consider:

- prerequisite(s)
- supporting module(s) (other CTS modules that may enhance the learning opportunity if offered with the module)
- module parameters
  - instructional qualifications, if specialized
  - equipment and facility requirements, if specialized.

The module parameters are defined for each module in Sections D, E and F of this Guide.

Degree of Flexibility

The CTS program, while designed using the modular structure to facilitate flexible timetabling and instructional delivery, does not mandate the degree of flexibility a school or teacher will offer. The teacher and school will determine the degree of flexibility available to the student. Within the instructional plan established by the school, the student may:

- be given the opportunity to progress at a rate that is personally challenging
- have increased opportunity to select modules that develop competencies he or she finds most relevant.

Integrating Basic Competencies

The basic competencies relate to managing learning and resources, problem solving and innovation, communicating effectively, working with others and demonstrating responsibility are developed throughout the CTS program, and are within each module.

Assessment of student achievement on the basic competencies is integrated throughout the other module learner expectations. Refer to Section G (Assessment Tools) of this Guide for the description of student behaviours expected at each of the four developmental stages defined for the basic competencies.

Assessment of basic competencies could include input and reflection involving the student, teacher(s), peers and others. Description of the observed behaviour could be provided through a competency profile for the module. Positive, ongoing interaction between the student and teacher will support motivation for student growth and improvement.

Assessing Student Achievement

Assessing student achievement is a process of gathering information by way of observations of process, product and student interaction.

Where appropriate, assessment tools have been defined to assist the teacher and student in the assessment. Refer to Section G (Assessment Tools) of this Guide for copies of the various tools (worksheets, checklists, sample questions, etc.).

A suggested emphasis for each module learner expectation has also been established. The suggested emphasis provides a guideline to help teachers determine time allocation and/or the appropriate emphasis for each MLE and student grade.

Recognizing Student Achievement

At the high school level, successful demonstration of the exit-level competencies in a module qualifies the student for one credit. Refer to Section A of this Guide for more detailed information about how curriculum and assessment standards are defined in CTS. Refer to the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* (Appendix 12) for more information on how student achievement can be recognized and reported at the school and provincial levels.

Portfolios

When planning for instruction and assessment, consider a portfolio as an excellent tool to provide evidence of a student's effort, progress and achievement. Portfolios will aid students in identifying skills and interest. They also provide the receiving teacher, employer and/or post-secondary institution proof of a student's accomplishments. The make-up and evaluation of the portfolio should be a collaborative agreement between the student and teacher.

Resources

A comprehensive resource base, including print, software and audio-visual, has been identified to support CTS strands. It is intended that these resources form the basis of a resource centre, encouraging teachers and students to access a wide selection of resources and other information sources throughout the learning process. Unless otherwise noted, these resources are considered to be suitable for both junior and senior high school students.

Authorized resources may be obtained from the Learning Resources Distributing Centre or directly from the publisher or distributor. Refer to Section I (Learning Resource Guide) of this Guide for the complete resource list including curriculum correlations and resource annotations. Additional sources refer to noncommercial or government agencies that offer resources that may be of assistance in this strand.

Sample Student Learning Guides

In addition to the resources, Sample Student Learning Guides are available (refer to Section J of this Guide). These samples, designed for individual student or small group use, provide an instructional plan for selected modules and include the following components:

- Why take this module?
- What are the entry-level competencies?
- What are the exit-level competencies?
- What resources may be accessed?
- What assignments/activities must be completed?
- What are the timelines?
- How will the final mark be calculated?

PLANNING FOR DESIGN STUDIES

The following suggestions are provided to assist teachers and school and school system administrators as they plan to deliver modules from the Design Studies strand.

Selecting Modules

The scope and sequence chart in Section B provides an overview of the Design Studies modules, indicating prerequisites and theme areas. Brief descriptions of the modules follow the scope and sequence chart in Section B.

Design Studies has been developed for both junior high and senior high school students. The Design Studies modules may be offered in a variety of contexts, depending on local need and on the human and physical resources available in the school and community. The curriculum has been designed so that individual modules or clusters of modules can be offered. Some schools may wish to concentrate on the two-dimensional design modules while others will prefer to offer the modules in three-dimensional design or drafting for design or technical drawing. Each module has a value of 1 credit, so clustering may occur in traditional 3- or 5-credit units or in other configurations.

Not all schools will want to offer a full Design Studies program. Courses may be constructed by using only Design Studies modules or by combining Design Studies modules with modules from other CTS strands.

Sample

An example of a 3-credit Design Studies course is:

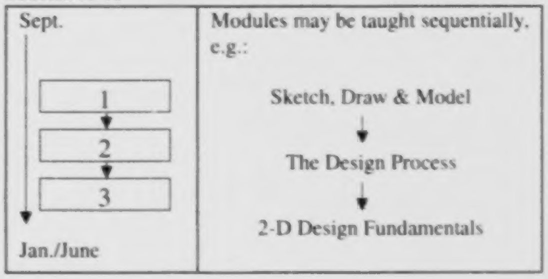
MODULES
• Sketch, Draw & Model
• The Design Process
• Drafting/Design Fundamentals

RATIONALE/LEARNINGS
Students have the opportunity to learn a process of "design" (through experiences in two- and three-dimensional design), basic visualization skills (through sketching and drawing) and several basic drafting styles and techniques (pictorial drawing and multiview drawing). This course complements the visual arts and science programs and other CTS strands. Students use various basic tools and materials in several contexts.

Organizing for Learning

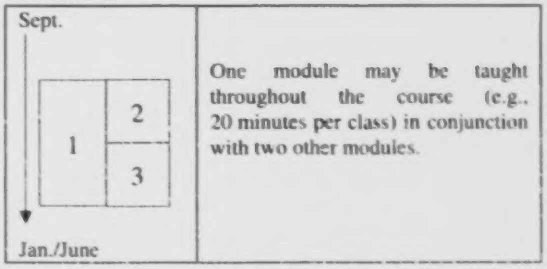
Before selecting modules, teachers should check the module parameters outlined in each module (see Sections D, E and F of this Guide).

Scenario A



Modules may be taught sequentially, e.g.:

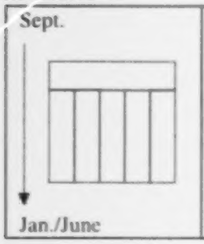
Scenario B



One module may be taught throughout the course (e.g., 20 minutes per class) in conjunction with two other modules.

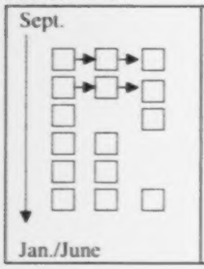
Teachers can also allow students to progress at a rate that is personally challenging; e.g.:

Scenario C



All students take one or two modules together, then are able to select modules from a menu of modules.

Scenario D



From a list of modules defined by the teacher, the students select which ones they will work on and, in consultation with the teacher, establish timelines for completion and submission of assignments, etc.

Design Studies has three levels of complexity: introductory, intermediate and advanced. There is appropriate rigour throughout all levels of the program with greater expectations placed on students as they progress. This rigour is determined by the complexity of the tasks and projects they engage in, the degree of background knowledge and skills they must bring to the task and the degree of personal responsibility expected of students.

Design at all levels requires creativity, perseverance, technical skills, and knowledge and an understanding of and ability to use process. This does not mean that students are expected to have all of these attributes when they enter the introductory level. These attributes must be taught to students and developed over time. It is unfair to expect students to be able to produce designed solutions to problems without having the necessary prerequisites. Teachers must teach the necessary skills and knowledge at each level required by the tasks they assign. Students should be expected to apply learned knowledge and skills to future tasks and to add new learning through this process.

The information presented here provides an overview of program expectations to guide your instruction. It gives you a sense of the scope of the Design Studies program, its direction and what should be expected of students at each program level. Expectations for each module are found within the modules themselves along with criteria to guide assessment.

Introductory Level (Fundamentals)

The introductory level of Design Studies is characterized by the term "fundamentals" and as such provides basic skills and knowledge to students that they use and add to at succeeding levels. Depending on the modules taken, students successful at the introductory level should be able to do the following:

- look at simple objects and draw them freehand with reasonable accuracy
- draw simple objects and common geometric forms with the aid of mechanical instruments and/or a computer
- recognize the steps of a design process (design loop) and be able to identify them
- solve simple pre-set problems by following a design process
- use basic techniques common to two- and three-dimensional design such as measuring, cutting, pasting, joining
- recognize and use some of the elements (e.g., line, shape/form, space) and principles (e.g., balance, proportion, emphasis) in their work.

At the introductory level students must be taught how to draw, how to use common instruments (including a computer for computer-aided design (CAD) where applicable) and how to solve problems. Where teachers begin with this teaching depends on their student(s). For some students, drawing begins with learning to hold a pencil properly, so the introduction to CAD will begin with locating the power switch on the computer. Other students will come equipped with a battery of skills that allow teachers to begin instruction at a more advanced level.

Where problem solving is concerned, students should be presented with simple challenges of short duration, which allows them to repeat the design process over and over again with teacher guidance. Providing students with a complex challenge that takes a long time to complete discourages the students and also provides limited experience with the process. Designing is like swimming in that the basic skills are learned in the safety of shallow water and then applied in more challenging environments as the swimmer's ability and confidence increases. In design, students need to solve a series of simple problems then move onto more complex challenges as their abilities develop.

Intermediate Level (Applications)

Students who successfully complete intermediate level modules should be able to demonstrate what they learned at the introductory level (basic skills and knowledge from the modules they took) plus they should be able to use these skills and knowledge to complete assigned tasks independent of teacher direction. For example, students who completed all introductory level modules should be able to do the following:

- draw a simple object freehand
- produce a pictorial drawing of an object using an isometric grid
- accurately measure the distance between two points
- brainstorm five potential solutions to a simple design challenge
- other requirements specific to the modules taken; e.g., demonstrate basic CAD operations.

Specific skill and knowledge development at the intermediate level centres around the following:

- broadening the recognition and use of the elements and principles of design in many design contexts
- refining previously developed skills and learning new skills in two- and three-dimensional design specific to the assignments given
- producing additional styles of pictorial drawings
- producing multiview drawings for defined purposes (e.g., house plans, machined tools) and accurately dimensioning them
- further developing computer skills as they apply to CAD
- obtaining a rudimentary understanding of the history of design
- other requirements specific to the modules taken.

Teachers should expect students who have completed three or more intermediate level modules to be able to assume greater responsibility for their learning where they have been taught the prerequisite skills and knowledge. This responsibility may appear in the student's ability to make rational decisions and to act on his or her decisions. It is not good enough for a student to just be able to demonstrate a particular skill if the teacher must continually guide the student throughout the task. Given a straightforward task (e.g., design a poster to advertise a school dance, design a bus shelter, design a tooth brush and produce a model) intermediate level students should be able to take on the task and complete it. They should be able to plan their project, select and use appropriate materials, tools and equipment (safely and within established guidelines), manage their time and activities, and present their work at any stage of development. The introduction of new knowledge, skills and associated materials, tools, processes, procedures, or specific requirements can be the focus of new teaching.

Advanced Level (Studio)

The notion of "studio" presents the opportunity for students to work with greater independence from direct instruction so they can solidify previous learning and experiment with new ideas. It has been adopted by Design Studies to signify the advanced level of the strand. The areas of two- and three-dimensional design, CAD, drafting for design, technical drawing and history have been carried forward from previous levels. The additional foci of living environments (e.g., interior, environmental and architectural design), the business and profession of design and preparation of a polished portfolio for presentation to potential clients, employers or post-secondary institutions are found at this level.

Students at the advanced level should be able to demonstrate skills and knowledge developed at the introductory and intermediate levels based on the modules taken. In addition, they should be able to:

- take on a project of greater complexity and work it through to a successful conclusion with very limited teacher direction
- work successfully as a member of a design team and take on various roles as required
- develop additional skills specific to CAD particularly computer modelling
- develop skills in rendering and explanatory drawing and use these to explore, explain and illustrate design concepts and ideas as required within a project
- prepare a variety of technical working drawings (detail and assembly drawings), including sections, elevations, auxiliary views, developments and intersections based on the projects assigned
- demonstrate an understanding of the history of design and be able to suggest future directions in at least one area of design
- identify different opportunities in the business and profession of design and how those opportunities may be taken advantage of
- produce a portfolio suitable for presentation to a potential employer, post-secondary design school or potential client
- other requirements specific to the modules taken.

The Design Process Overview

Fundamental to all design is the recognition and application of process. Some models describe design as a linear process beginning with the identification of a problem to be solved and ending with the evaluation of a "designed" solution. Other models identify a series of steps on a circle beginning with problem identification and evolving to a "designed" solution, which may spawn a new problem, continuing the cycle. Current thought recognizes design as an iterative★ process, which may begin with an identified problem and evolve to a "designed" solution through a process that may require the designer to repeat the same steps several times over, each time getting closer to a finished design. Recognizing the nature of design and being able to apply the process of design in many contexts is the basis of Design Studies.

Three introductory level modules provide basic instruction in the design process. These modules illustrate the process of design, explore some fundamental techniques used in the context of two- and three-dimensional design and provide an opportunity for students to engage in a series of design problems where they can be guided through the application of both process and technique.

Modules:
- The Design Process
- 2-D Design Fundamentals
- 3-D Design Fundamentals.

Two-dimensional Design and Three-dimensional Design Overview

Designers working in two dimensions (2-D) are primarily concerned with surface design, while those working in three dimensions (3-D) are more interested in the structure and form of the design. 2-D and 3-D design can take many forms and often overlap. For example, some 2-D designers may design printed communication such as books, posters or brochures, while 3-D designers may design furniture, tooth brushes or children's toys. Other 2-D designers may create signs for buildings and vehicles, credits for television and film or charts and graphs for year-end reports. The 3-D designer may design buildings, televisions, cars or clothing. Some designers combine 2-D and 3-D in product packaging, in museum or retail display or in fabrics or wall coverings for personal living, public or commercial spaces.

★ Iterative: repeating; full of repetitions. *Gage Canadian Dictionary*, 1983.

The 2-D and 3-D Design—Applications modules at the intermediate level and the respective advanced level studio modules allow students to develop and enhance basic 2-D and 3-D design skills and knowledge learned in the introductory Design Studies modules. Specific learnings are determined by the design tasks engaged in, particularly at the intermediate level. Each advanced level studio module has a specific focus that will guide the design considerations in that module.

Modules:
- 2-D Design Applications
- 3-D Design Applications
- 2-D Design Studio 1
- 2-D Design Studio 2
- 2-D Design Studio 3
- 3-D Design Studio 1
- 3-D Design Studio 2
- 3-D Design Studio 3

Living Environment Overview

Living Environment modules focus on architecture, interior design and environmental design. The spaces in which people live and interact are extremely important to their well-being. If a house, apartment or condominium meets the need of the people living in it, then it is of value. If a park or playground is well designed, it will offer its users many enjoyable hours and will be an asset to a community or location. Conversely, if the physical restrictions of a commercial space prevent effective commerce from occurring, the occupant will soon be out of business. The Living Environments modules put in context the knowledge and skills gained in other design modules in a specific application. As with the other advanced level Design Studies modules, each module provides a specific focus or point of reference for learning.

Modules:
- Living Environment Studio 1
- Living Environment Studio 2
- Living Environment Studio 3

CAD Overview

Computers are increasingly important as a tool for design. It must be stressed, however, that the ability to design and the ability to operate a computer-based "design" tool (e.g., CAD system, drawing or paint programs, desktop publishing programs) are not the same thing.

Successful designers in all likelihood are able to use the computer and peripheral technology (e.g., scanners, plotters, modems) with the same ease and effectiveness as they use a pencil, camera, model making material or a telephone. Although the computer can remove much of the repetitive labour-intensive aspects of design, freeing the designer to explore a greater number of ideas and potential design solutions, it is only one of many tools at the designer's disposal.

The CAD modules concentrate on teaching skills and techniques specific to the software and hardware available. These modules will need to be complemented with other Design Studies modules where the skills can be applied, reinforced and enhanced and/or with skills-based or process-based modules from other strands (e.g., keyboarding modules from Information Processing, process-based modules from Communication Technology or Construction Technologies).

Modules:
- CAD Fundamentals
- CAD Applications
- CAD Modelling Studio

Drafting for Design Overview

The ability to observe reality and represent it in a drawing is an essential skill for designers. While most design students use this skill as a vehicle for representing and communicating ideas and for clarifying design problems, students who excel in drawing may go on to become artists and illustrators. The drawing and modelling component of Design Studies begins with developing a range of observational drawing and modelling skills and augments these with specific techniques and drawing styles commonly associated with "drafting." These techniques and drawing styles are used to visualize and clarify designs as they are developed (e.g., isometric projections of different designs being considered for a chair, hair dryer or wind surfer, floor plans for a cottage, commercial outlet, kitchen renovation). The Drafting for Design modules emphasize the visual representation of design projects that are accurate in scale and proportion to the finished product. They differ from Technical Drawing modules, which emphasize the production of multiview, detail and assembly drawings, and include dimensioning, specifications and conventions required for the fabrication, manufacture and/or construction of the project.

Each drawing module emphasizes specific learnings such as different drawing styles and terminology (e.g., sketching and base drawings), specialized drawings and their use in illustrating particular design ideas (e.g., the cross-section of a running shoe to show the various layers of the sole) and particular illustrative techniques (e.g., rendering techniques). The competencies attained through the modules at each level form the basis for the next higher level. These learnings are reinforced through their application in other design process modules and are augmented through the more specific focus of the Technical Drawing modules at the intermediate and advanced levels.

Note: Please refer to the CAD Overview and the Note in the Technical Drawing Overview below.

Modules:

- Sketch, Draw & Model
- Drafting/Design Fundamentals
- Drafting/Design Applications
- Drafting/Design Studio 1
- Drafting/Design Studio 2
- Drafting/Design Studio 3

Technical Drawing Overview

Technical drawings are required to clearly communicate specifications for fabrication, manufacturing and/or construction. In the Technical Drawing Application and Studio modules, students develop working drawings based on design sketches of varying complexity. These are skill development modules and support the more process-based modules in the strand. They differ from the Drafting for Design modules in that the products of these modules are detailed working drawings, accurately dimensioned and reflecting the codes, standards and conventions required by the project being drawn.

Each technical drawing module emphasizes specific learnings (e.g., basic technical drawing styles, terminology, and conventions, dimensioning and notation, specialized technical drawings). These are learned within the context of drawing tasks assigned. Students attaining the competencies in the intermediate level module learn technical drawing skills that they can apply in detailing their design work. Students completing all four technical drawing modules, in combination with other Design Studies modules, develop specific skills, recognize the use of different types of technical drawings and are able to produce appropriate drawings as required in the context of various design projects.

Note: The tools used to complete these modules may vary depending on what is available to teachers and students. The modules have been written so that students with access to CAD systems or to traditional tools (e.g., drawing tables, drafting machines) can be equally successful. However, CAD is quickly becoming the standard in most post-secondary and industrial settings.

Modules:

- Technical Drawing Applications
- Technical Drawing Studio 1
- Technical Drawing Studio 2
- Technical Drawing Studio 3

Business, Issues and History Overview

Design as a profession forms the basis for many business enterprises. Wherever new products or applications are being developed or new ways of doing things are being conceived, the design process is occurring and professional designers are often involved. Two of the four modules within the Business, Issues and History theme of Design Studies provide students with an overview of design as it has evolved over time. Different avenues of design and examples of work (e.g., the evolution of buildings, posters, shoes, cars, telephones, materials such as plastics, processes such as types of energy generation) may form the basis for these modules.

One module looks at the business of design including the wide variety of career options and employment opportunities available to students. Students are expected to investigate the degree and type of training required to enter their chosen field. For students planning on pursuing a career in design, the preparation and presentation of a portfolio is extremely important. This is the focus of the final module in this section.

Modules:
- The Evolution of Design
- Visualizing the Future
- The Design Profession
- Portfolio Presentation

Group Teamwork

The ability to work as part of a team is generally recognized as being essential in today's workplace. The rapid changes in technology and the increase of knowledge require that people pool expertise, and this can be expected to become a crucial factor in the future. Design Studies offers an excellent opportunity for your students to work in a team setting, either formally (pre-set teams) or informally (peer tutoring as needed or advantage arises).

There are many advantages in having students helping each other. First, they mutually enhance their communication skills. Second, they tend to generate more ideas than could be generated by each individual working separately. Third, if students are helping each other most of the time, you have more time to deal with major issues and to facilitate the work of the teams. Central to this concept is student-managed learning rather than teacher-directed learning. It is a different type of role for many teachers, one that may already be part of your teaching strategies, or one that you may wish to try.

Critique Sessions

A critique can be defined as a critical review. Its purpose in Design Studies is to:

- provide suggestions and feedback to the presenters regarding their designed solutions
- provide new ways of looking at the problem with respect to the presenter's solution
- provide suggestions for improvement in all aspects of the designed solution and the presentation technique
- give students an opportunity to have a "moment of glory," as they have the floor and present something they designed themselves. (This becomes a great opportunity for the shy, creative students to become recognized by their peers for their talents.)

Presentations and critiques should take place only when participating students in the design class have a VISUAL representation of their design solution to the current design problem. It is difficult to respond to students who present what they intend to do for their design solution rather than the solution itself. You may have a student present a partly resolved idea to help them further their thinking through others' suggestions.

To be successful and meaningful, critiques must be orchestrated following some basic rules. Such rules could include:

- No destructive criticism or derogatory remarks.
- Only constructive criticism and suggestions allowed.

- No editorial comments (e.g., "This design is the pits"). However, personal opinions couched in one's experience with a similar problem may be allowed.
- The Golden Rule applies—i.e., "Constructively criticize each presenter's design solution as you would have them constructively criticize yours—you may be the next presenter."

Some students may not see the value or the purpose of the critique session. They have to be made aware that others, who may be removed from the problem or who may have encountered similar difficulties with the problem, may be able to provide new insight to a better solution for them.

You may wish to allot a percentage portion of the overall grade for the project to the critique session. Also, insist that all students in the design class present their work (at some time) and remind them that sooner or later "it will be your turn" to present.

Critique sessions can take various forms. However, they usually involve the class teacher as moderator and the students in the design class, as the presenters and critique participants. (Note: advanced level students should be able to moderate critiques as well.) "Outside Members" who may be other teachers and students from other classes may join critique sessions to act as (pseudo) lay persons or clients; i.e., they may be unsophisticated relative to the particular design solution being presented. If the presenter is able to make the outside members understand his or her designed solution, this becomes a good indicator of the viability of the solution.

If possible, invite guests sophisticated in design such as architects, engineers, interior designers, industrial designers, graphic designers, etc., to major critique sessions. The presence of professionals really gives the critique session a sense of legitimacy. A good source of professionals or undergraduate professionals is the pool of the past design students who have gone on to universities and colleges and technical schools. Past students enjoy coming back to help out in such instances. This would be particularly useful to advanced level students.

Organizing and conducting a critique should include the following:

- Students should be informed well before the critique session that each would be expected to have their drawings/models up to an acceptable stage of VISUAL presentation for a critique session by a certain date.
- At the beginning of the "crit session," the moderator (usually the design class teacher) explains or reiterates the rules for conducting a critique (see previous notation).
- Each student's work is set up for display at his or her turn so that all the members of the class can view the work.
- One student presents and explains his or her design as well as the rationale behind the decisions made to arrive at the solution. This is provided uninterrupted to the group as an overview of the work.
- At the conclusion of this student's presentation, the moderator then opens up the critique session to discussion.
- One student from the group speaks to the presenter at one time.
- The crit session atmosphere should be quiet and restrained, with studious participation by all the students in the group. It is important that this is established as the crit session could very quickly become a shambles of rowdy, bickering and destructive criticism.
- Moderators should draw questions out of all students, paying particular attention to the shy students in the group. (Often these students have the best, more thoughtful, careful considered questions and analysis.)
- At the end of each student's crit session, the moderator should review the main points of the group's criticism and suggestions.
- The next student then sets up his or her display for presentation.

The following is a selection of questions and suggestions that may be suitable for a critique session.

- "Could you explain how you . . ."
- "Have you considered . . ."
- "How do you achieved . . ."
- "I had a similar problem and I solved it this way . . ."
- "Could you not do . . ."
- "How do you get to the kitchen from the garage?"
- "What is the purpose of this gadget here?"
- "If you did . . . wouldn't you then be able to do . . ."
- "How does this work?"
- "What if you tried . . ."
- "How do you know this will work?"
- "Perhaps before you proceed any further you should check up on . . . theory or (body of knowledge)."
- "You should check your design brief to review the requirements for the design solution."

Critiques are a valuable tool for exploring a student's knowledge of design theory and practice. Once students become accustomed presenting their design work in a safe and constructive environment, they will value the sessions for providing helpful information and for giving them an opportunity to show what they can do.

Identifying Linkages

Refer to Section H of this Guide for CTS modules that enhance the learnings defined in Design Studies. As well, linkages to other complementary and core programs are described. Design Studies links with Drafting, Graphic Arts and Visual Communications. Please see Section H for details.

Note that project modules from the Career Transitions strand may be combined with modules from Design Studies to provide increased opportunity for students to develop expertise and refine their competencies. Project modules are **not** designed to be offered as distinct courses and should **not** be used to extend Work Experience 15, 25 and 35 courses.

Improving Smooth Transitions to the Workplace and/or Related Post-secondary Programs

Refer to Section H of this Guide for potential transitions students may make into the workplace and/or related post-secondary programs or other avenues for further learning.

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION D: INTRODUCTORY LEVEL

The following pages define the curriculum and assessment standards for the introductory level of Design Studies.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are developed for students who have no previous experience in the strand.

Module learner expectations define the competencies a student must demonstrate to achieve success in a module. Assessment standards define the criteria and conditions to be used for assessing the competencies defined in the module learner expectations.

Specific learner expectations provide a detailed framework for instruction to help students build the competencies defined in the module learner expectations. Additional information and suggestions for instruction are provided in the Notes column; teachers may wish to use this space to record their ideas for instruction or student projects.

Module DES1010: Sketch, Draw & Model D.3
Module DES1020: The Design Process D.7
Module DES1030: 2-D Design Fundamentals D.11
Module DES1040: 3-D Design Fundamentals D.15
Module DES1050: CAD Fundamentals (Computer-aided Design) D.19
Module DES1060: Drafting/Design Fundamentals D.23

MODULE DES1010: SKETCH, DRAW & MODEL

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students are introduced to observational sketching and drawing, and modelling, and to a selection of materials and tools and their uses. Students also develop skills that can be used and enhanced in further design activity.

Module Parameters: Access to basic sketching, drawing and modelling tools and equipment and a computer.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline and/or in fine art.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• sketch, manually, and draw and model, natural and manufactured three-dimensional forms	• sketches, drawings and models of natural and manufactured three-dimensional forms produced in response to teacher-specified assignments. Images will be recognizable as the subject and demonstrate a sense of proportion and scale. *Assessment Tool* *Project Assessment: Techniques, Tools, Materials and Applications Checklist (DESPRJ–1A)* *Standard* *Performance rating of 1 for each criteria*	60
• use manual sketching/ drawing and modelling materials, and tools effectively	• the use of three or more sketching, drawing and modelling materials and tools. *Assessment Tool* *Project Assessment: Techniques, Tools, Materials and Applications Checklist (DESPRJ–1A)* *Standard* *Performance rating of 1 for each criteria*	30

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio emphasizing the development of sketching, drawing and modelling skills. *Assessment Tool* *Presentations/Reports: Design Skills, Processes and Applications (Introductory) (DESPRE–1A)* *Standard* *Performance rating of 1 for each criteria*	10
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• draw real objects; e.g., human forms, natural and manufactured objects, artifacts from different materials with differing textures and reflective properties • demonstrate various sketching and drawing styles used in different contexts; e.g., gesture, contour, tonal, isometric, perspective • demonstrate observational modelling to capture the essence of forms through easily manipulated materials; e.g., clay, paper, cardboard • demonstrate use of shape, and form; e.g., flat shapes on surfaces, 3-D forms joined together to make new forms, 3-D forms in proximity to each other • demonstrate use of more than one medium (e.g., pencil, chalk, coloured marker, ink, paint, paper, plastic, wood, foam) to draw, sketch and model.	Sketching, drawing and modelling skills can only be developed through practice. Some students will exhibit natural ability in this area, while others will need a lot of specific instruction. Holding a pencil correctly may be new and different for some students. Using visual construction techniques such as drawing a cylindrical shape inside or three-dimensional box will help many students with proportion and visual/ spatial relationships. An introduction to basic drawing tools; e.g., pencils, rulers, set squares, will also help students with limited background in this area.

MODULE DES1010: SKETCH, DRAW & MODEL (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:*	Designers who work in three dimensions often visualize their ideas by manipulating various materials such as wooden or foam blocks of differing shapes. This manipulation provides a three-dimensional model of what the potential solution might look like with respect to size, shape, volume, etc. Different media provide different results and students need to be aware of this. Skills in the use of various media will develop as students engage in other design activities.
Presentation, Design Journal and Portfolio	• show and describe sketches, drawings and models to the teacher and to at least one other class member • maintain a design journal/sketchbook. This would typically include notes, ideas and rough or thumbnail sketches • maintain a portfolio of ongoing observational drawing and modelling activities, which in this module would include all sketches, drawings and models produced in the module, the design journal and any other supplementary material considered important • describes how sketching, drawing and modelling assists in solving design problems.	Students at the introductory level may be reluctant to share and discuss their work with a group of their peers. Sharing can be done informally, one on one with the teacher, and as the opportunity presents itself, with one or more class members. The portfolio will provide a developmental record of the student's breadth and depth of observational drawing and modelling capability. It should be updated upon completion of each design task. Over time, less important examples of work should be replaced with more significant pieces.

MODULE DES1020: THE DESIGN PROCESS

Level:	Introductory
Theme:	Design Skills, Processes and Applications
Prerequisite:	None
Module Description:	Students begin this process-based activity by developing an understanding of the problem through research. They then develop possible solutions, working through them to arrive at a final, appropriate solution.
Module Parameters:	Access to basic sketching, drawing and modelling tools and equipment and a computer. Specialized facilities or equipment depend on the approach taken to the module. **Note:** It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline.
Supporting Module:	DES1010 Sketch, Draw & Model

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify a design process and apply it throughout the instructional period	• observation of the work processes throughout the instructional period and review of the design journal. *Assessment Tool* *Design Studies Process Standards Assessment Framework (DESPAF–1)* *Standard* *Performance rating of 1 for each criteria*	60
• produce a designed solution	• student's response to a teacher-specified, introductory level design brief in two-dimensional, three-dimensional, and/or combined two-dimensional and three-dimensional design. *Assessment Tool* *Project Assessment: Design Skills, Processes and Applications (Introductory) (DESPRJ–1B)* *Standard* *Performance rating of 1 for each criteria*	30

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio emphasizing the use of a process of design through module work. *Assessment Tool* *Presentations/Reports: Design Skills, Processes and Applications (Introductory) (DESPRE–1A)* *Standard* *Performance rating of 1 for each criteria*	10
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• state the components of a design process (design loop); e.g.: – identify the need/problem – research the problem – generate ideas and visualize potential solutions; e.g., through drawing, computer modelling, three-dimensional modelling – choose the most promising idea (the idea that seems to best meet the need identified in the design brief) – make/model the idea into a solution – present the solution – evaluate the solution	Design tends to be an iterative process; i.e., while the process of design may appear to be linear, students will typically revisit steps as the design activity progresses. Presentation of work at logical junctures within the planning and process stages provides an opportunity for students to share ideas, to gather ideas for their own projects, to develop their presentation skills and to build confidence in their abilities.

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MODULE DES1020: THE DESIGN PROCESS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:* • read a design brief and identify the task, constraints and other pertinent information.	This should be done in an informal manner. (See the notes on presentation from Sketch, Draw and Model.) Briefs are common in the design field. They provide the designer with basic information for the design task and are often based on something that exists.
Elements and Principles of Design	• identify the design elements (line, shape, form, pattern, space, texture, colour) and principles (balance, emphasis, proportion, rhythm, unity and variety) as they apply to composition and form.	Awareness of the elements and principles of design will increase with each design challenge. Students need only recognize the existence of these elements and principles in this module and be able to identify some of them.
Applied Problem Solving	• follow a design process to create solutions for one or more projects taken from two-dimensional design (e.g., poster, brochure, repetitive pattern, personal monogram), and/or three-dimensional design (e.g., cardboard desk organizer, cloth locker organizer, a self-propelled elastic band-powered car) and/or a project combining two- and three-dimensional design (e.g., bicycle light with logo, package for a festive ornament, model of a museum display or store window display package for an abstract idea such as multiculturalism) based on design briefs provided • select and use appropriate tools and materials as outlined in the design brief • use and maintain tools and materials in a safe and appropriate manner.	The product/solution to the problem will be determined by the need as stated in the design brief. Students will need help interpreting the first few briefs they receive. Successful designers tend to have a broad range of experience. Having students engage in a variety of design tasks will help to broaden their horizons and enhance their ability to design. Teachers may wish to limit tools and materials to provide specific constraints to the design projects assigned.

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	*The student should:* • show and describe projects with the teacher and with at least one other class member • maintain a design journal and a portfolio, which in this module would include all design work such as drawings, research notes and designed solutions, and any other supplementary material considered important • prepare for and actively participate in a final presentation and critique of design work. Effectively communicate intentions and decision making related to the design project.	Students need to be constructively critical of their own designs and the designs of others. It is not good enough to "like" or "dislike" without giving reasons for their preference. It is important that they recognize this both as designers and as consumers of design. At this level they should be able to critically discuss their work with their teacher. Students can track the steps they took and materials/processes they used in solving their design brief. Their journal can become a future reference source. It is also a good mechanism for assessing process.

MODULE DES1030: **2-D DESIGN FUNDAMENTALS**

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop skills and techniques appropriate to two-dimensional design by engaging in a variety of activities in various contexts. Techniques may include drawing, layout, use of tools and equipment appropriate for two-dimensional design, cutting, joining, measuring and use of notations.

Module Parameters: Access to basic sketching, drawing and layout tools and equipment and a computer. Specialized facilities or equipment depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline.

Supporting Module: DES1010 Sketch, Draw & Model

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify and practise two-dimensional design techniques; e.g., layout, use of grids, use of typography	• proficient use of teacher-specified two-dimensional design techniques through practice exercises. *Assessment Tool* *Project Assessment: 2-D Design Fundamentals Checklist (DES1030–1)* *Standard* *Performance rating of 1 for each criteria*	25
• identify and use materials and tools common to two-dimensional design; e.g., card, cutting tools, computer graphics packages	• proficient use of teacher-specified tools and materials through practice exercises. *Assessment Tool* *Project Assessment: 2-D Design Fundamentals Checklist (DES1030–1)* *Standard* *Performance rating of 1 for each criteria*	25

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify, select and use elements and principles of design in project activities	• identification of elements and principles of design through teacher-specified examination or project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principles of design* *Project Assessment: Design Skills, Processes and Applications (Introductory) (DESPRJ–1B)*	10
• use two-dimensional design techniques to solve simple design problems; e.g., advertisement layout, greeting cards, sign, poster, package graphics	• proficient use of at least two sketching, drawing and/or layout techniques in the context of resolving a teacher-specified introductory level design brief. *Assessment Tool* *Project Assessment: 2-D Design Fundamentals Checklist (DES1030–1)* *Standard* *Performance rating of 1 for each criteria*	30
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio emphasizing the techniques learned through module work. *Assessment Tool* *Presentations/Reports: Design Skills, Processes and Applications (Introductory) (DESPRE–1A)* *Standard* *Performance rating of 1 for each criteria*	10
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES1030: 2-D DESIGN FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • demonstrate techniques common to two-dimensional design such as: – brainstorming ideas; e.g., thumbnail sketching, working with a partner to generate ideas – laying out; e.g., shapes and images within a defined space, aligning, measuring, cutting, joining, drawing design components – using typography; e.g., generating and manipulating letters, numbers and symbols – preparing camera ready artwork for specific purposes (e.g., line negatives and positives) • use terminology associated with the techniques learned; e.g., know what a thumbnail sketch is and how it is used, know the similarities and differences between a serif and san-serif type styles • demonstrate basic skills associated with tasks engaged in; e.g., be able to organize several images within a defined two-dimensional space using the principles of design, and be able to measure accurately and cut/join/manipulate materials safely.	The techniques and terminology learned in this module will form part of the foundation for continuing on in Design Studies. Additional techniques and terminology will be learned in other modules as the need arises. Teachers may wish to teach additional material in this module where appropriate to their program.
Elements and Principles of Design	• identify the elements and principles of design and use them in the context of the techniques learned and problems addressed • describe how and why elements and principles were used in project work • organize visual elements using selected strategies (e.g., rule of thirds, "S" curve, positive/negative space) in completing technical exercises and projects.	The elements and principles of design are listed in The Design Process.

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • select two or more two-dimensional design problems and work them through, using a process of design • use basic techniques common to two-dimensional design in working through design problems • select and use appropriate tools and materials as outlined in the design brief.	Teachers may wish to prescribe design briefs for their students in this module in order to ensure specific techniques are learned. Students are expected to work within the constraints identified in each design brief. Constraints related to materials, deadlines, function, aesthetics, ergonomics, etc., will require students to assign priority to optimize their result. Students will need guidance to learn the decision-making skills necessary to do this.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations in Sketch, Draw & Model and The Design Process.	For some students, this will be the third module taken in Design Studies. Students who are comfortable with presenting their work to others should be encouraged to do so. Through discussing their work with others, the basics of critiquing (making and receiving suggestions) can be established. To encourage students to present and discuss their work, teachers may have two or three students make a joint presentation, thereby reducing the pressure on one individual.

MODULE DES1040: 3-D DESIGN FUNDAMENTALS

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop skills and techniques appropriate to three-dimensional design, by engaging in a variety of activities in various contexts. Techniques may include drawing, modelling, use of tools and equipment appropriate to three-dimensional design, cutting, joining, measuring and use of notations.

Module Parameters: Access to basic sketching, drawing and modelling tools and equipment and a computer. Specialized facilities or equipment depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline.

Supporting Module: DES1010 Sketch, Draw & Model

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify and practise three-dimensional design techniques; e.g., cutting, joining, manipulating	• proficient use of teacher-specified three-dimensional design techniques through practice exercises. *Assessment Tool* *Project Assessment: 3-D Design Fundamentals Checklist (DES1040–1)* *Standard* *Performance rating of 1 for each criteria*	25
• identify and use materials and tools common to three-dimensional design; e.g., cardboard, plastic, wood, styrofoam, wire, modelling clay	• proficient use of teacher-specified tools and materials through practice exercises. *Assessment Tool* *Project Assessment: 3-D Design Fundamentals Checklist (DES1040–1)* *Standard* *Performance rating of 1 for each criteria*	25

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
- identify, select and use elements and principles of design in project activities	- identification of elements and principles of design through teacher-specified examination or project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principles of design* *Project Assessment: Design Skills, Processes and Applications (Introductory) (DESPRJ–1B)* *Standard* *Performance rating of 1 for each criteria*	10
- use three-dimensional design techniques to solve simple design problems; e.g., simple bridging structures, container, pencil holder	- proficient use of at least two sketching, drawing and/or layout techniques in the context of resolving a teacher-specified introductory level design brief. *Assessment Tool* *Project Assessment: 3-D Design Fundamentals Checklist (DES1040–1)* *Standard* *Performance rating of 1 for each criteria*	30
- select, organize and present design projects	- maintenance and presentation of a module-based design portfolio emphasizing the techniques learned through module work. *Assessment Tool* *Presentations/Reports: Design Skills, Processes and Applications (Introductory) (DESPRE–1A)* *Standard* *Performance rating of 1 for each criteria*	10
- demonstrate basic competencies.	- observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

MODULE DES1040: 3-D DESIGN FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• demonstrate techniques common to three-dimensional design such as: – brainstorming ideas; e.g., thumbnail sketching or modelling, working with a partner to generate ideas – manipulating forms and space; e.g., shaping and creating forms within a defined space – practising basic modelling techniques; e.g., measuring, cutting, joining, bending – relating materials and techniques; e.g., given a material, select useful tools for cutting, joining, bending • use terminology associated with the techniques learned • identify specified materials and tools and describe some of their characteristics and uses in the design context • use specified materials in a safe and appropriate manner • identify tools appropriate to design and use them in a safe and appropriate manner • demonstrate basic skills associated with tasks engaged in; e.g., be able to measure accurately and cut/join/manipulate materials safely.	The techniques and terminology learned in this module will form part of the foundation for continuing on in Design Studies. Additional techniques and terminology will be learned in other modules as the need arises. Teachers may wish to teach additional material in this module where appropriate to their program.
Elements and Principles of Design	• identify the elements and principles of design and use them in the context of the techniques learned and problems addressed • explain how and why elements and principles were used in project work.	The elements and principles of design are listed in The Design Process.

Concept	Specific Learner Expectations	Notes
	The student should:	
Applied Problem Solving	• select two or more three-dimensional design problems and work them through, using a process of design • use basic techniques common to three-dimensional design in working through design problems • select and use appropriate tools and materials as outlined in the design brief.	Teachers may wish to prescribe design briefs for their students in this module in order to ensure specific techniques are learned. Students are expected to work within the constraints identified in each design brief. Constraints related to materials, deadlines, function, aesthetics, ergonomics, etc., will require students to assign priority to optimize their result. Students will need guidance to learn the decision-making skills necessary to do this.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations in Sketch, Draw & Model and The Design Process.	For some students, this will be the third module taken in Design Studies. Students who are comfortable with presenting their work to others should be encouraged to do so. Through discussing their work with others, the basics of critiquing (making and receiving suggestions) can be established. To encourage students to present and discuss their work, teachers may have two or three students make a joint presentation thereby reducing the pressure on one individual.

MODULE DES1050: CAD FUNDAMENTALS (COMPUTER-AIDED DESIGN)

Level: Introductory

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop basic knowledge and skills in computer-aided design (CAD).

Module Parameters: Access to a computer with a CAD software package, a printer and/or plotter, and basic sketching and drawing tools and equipment.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and in CAD.

Supporting Module: DES1060 Drafting/Design Fundamentals

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• demonstrate basic knowledge and skills required to operate CAD software	• skills examination on CAD software. *Assessment Tool* *Teacher-designed examination (approximately 20 questions/tasks) specific to designated CAD application* *Standard* *Performance rating of 1 for each criteria*	30
• use CAD to produce and print/plot a multiview drawing and/or pictorial drawing and/or surface development	• production of a multiview and/or pictorial drawing and/or surface development. *Assessment Tool* *Project Assessment: CAD Fundamentals, (DES1050–1)* *Standard* *Performance rating of 1 for each criteria*	60

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio emphasizing his or her understanding of CAD software operation skills through the student's discourse regarding the process(es), tools, and functions used in producing his or her drawing(s). *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Introductory) (DESPRE–1B)* *Standard* *Performance rating of 1 for each criteria*	10
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• identify and demonstrate use of tools (e.g., pens, lines, fillets, chamfers, shapes, rulers, scales), methods (e.g., snapping to grid, measuring, scaling) and functions (e.g., snapping to the end of a line, centering, cleaning up, breaking lines) with teacher direction and assistance • read and interpret pictorial drawings and multiview sketches for pertinent information • use CAD skills to produce two-dimensional multiview drawing(s) complete with dimensions and/or pictorial drawings and/or surface developments complete with dimensions • print or plot drawings.	Some students may have the background to perform these operations upon entering the module. Students should be encouraged to share their knowledge with each other. Where appropriate, students could work as partners during this module. Complementary modules to this one are available in the Information Processing strand and may be drawn from there if additional emphasis is required.

MODULE DES1050: CAD FUNDAMENTALS (COMPUTER-AIDED DESIGN (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:*	Teachers will determine the computer and software students will use. An important indication of a student's skill development in this module will be how quickly they can access and use the CAD software to produce assigned drawings. This element of "speed" can be one indicator of capability when the student is assessed.
Applied Problem Solving	• select and use CAD tools, methods and functions to produce multiview drawing(s) (minimum three views) from simple three-dimensional objects (e.g., angled wooden blocks, foot stool, chair) or from pictorial drawing(s) (e.g., isometric, oblique, perspective) of these objects and/or pictorial drawings and/or surface developments • demonstrate the use of layers on at least one drawing.	Applied problem solving in this module centres on the student's ability to select appropriate tools, methods and functions for achieving specific tasks.
Presentation, Design Journal and Portfolio	• print/plot drawings and include them in a design portfolio.	As this is a skill development module, students may not formally present their work as they would in other modules (e.g., 3-D Design Fundamentals). Students should still be able to describe what they are doing if asked.

MODULE DES1060: DRAFTING/DESIGN FUNDAMENTALS

Level: Introductory

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop basic knowledge, skills and techniques to draft appropriate drawings for visualizing and illustrating simple design problems.

Module Parameters: Access to basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and where applicable in CAD.

Supporting Module: DES1010 Sketch, Draw & Model

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce pictorial representations and multiview drawings from sketches and/or three-dimensional objects	• production of one of each of the following based on teacher-specified three-dimensional references and/or sketches: – freehand pictorial drawing aided by a pictorial drawing grid – pictorial drawing aided by mechanical drafting equipment or CAD – dimensioned multiview drawing aided by mechanical drafting equipment or CAD. *Assessment Tool* *Project Assessment: Drafting/Design Fundamentals (DES1060–1)* *Standard* *Performance rating of 1 for each criteria*	90

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MODULE DES1060: DRAFTING/DES!GN FUNDAMENTALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
OR	OR	90
• produce pictorial representations and surface developments for items in context; e.g., garments, sheet metal fabrication, packaging	• production of the following based on teacher-specified three-dimensional references and/or sketches: – two freehand pictorial drawings of items (e.g., garments, sheet metal, packaging) in context – one surface development for construction aided by mechanical drafting equipment or CAD. *Assessment Tool* *Project Assessment: Drafting/Design Fundamentals. (DES1060–1)* *Standard* *Performance rating of 1 for each criteria*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and the student's discourse, emphasizing his or her understanding of basic drafting techniques and their application to drawings produced. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Introductory) (DESPRE–1B)* *Standard* *Performance rating of 1 for each criteria*	10
• demonstrate basic competencies.	• observation of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES1060: DRAFTING/DESIGN FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• identify common pictorial drawing types; e.g., isometric, oblique, one- and two-point perspective • identify multiview drawings, their common views (e.g., front, top, side) and discriminate between first angle projections and third angle projections • produce at least one of the following within the context of assigned projects: – isometric drawing – oblique drawing (either Cavalier or Cabinet) – perspective drawing (either one-point or two-point) or – at least one drawing in three-dimensions appropriate for illustrating assembled surface developments (e.g., packaging, clothing, heating/ventilation ducting) • produce at least one of the following within the context of assigned projects: – one multiview drawing (e.g., front view, side view, top view) – one surface development (flat pattern) (e.g., for a package, heating/ventilation duct, garment)	In this module, students should engage in a variety of activities that will teach basic drafting skills and techniques. These could be extensions of designs developed in previously completed modules such as 2-D Design Fundamentals or 3-D Design Fundamentals. Teachers will need to determine the number of drawings of each type necessary for students to develop skills and understanding in this area. Students may demonstrate more than one drawing style within the same assignment. For example, a student may produce a multiview drawing (e.g., front, top, side views) of a toy he or she designed and pictorial drawing (e.g., isometric) of the toy on the same drawing sheet. "Drafting" may be applied in a number of contexts beyond the drafting table or terminal. One of these is flat pattern design within the fashion industry. This module exemplifies the linkage and transferability between traditional disciplines.
	• use general drafting conventions (e.g., title blocks) where appropriate.	Students may use traditional drafting technology, CAD or other technology specified by the teacher during this module.

MODULE DES1060: DRAFTING/DESIGN FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • use drafting techniques learned in this module to illustrate particular aspects of designed solutions to simple design problems; e.g., a hinge system on a box lid, a seam where two surfaces are joined, a pin to hold a wheel on an axle • where appropriate, use drafting techniques to illustrate how parts of a design go together.	Students should recognize drafting skills and techniques as tools they can use in many areas of design. Teachers may wish to brainstorm possible uses of these techniques with their students. Applied problem solving here relates to the student's ability to select appropriate techniques from those learned in this module to produce required illustrations.
Presentation, Design Journal and Portfolio	• see the Specific Learner Expectations for Sketch, Draw & Model and CAD Fundamentals.	See notes for 2-D Design Fundamentals.

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION E: INTERMEDIATE LEVEL

The following pages define the curriculum and assessment standards for the intermediate level of Design Studies.

Intermediate level modules help students build on the competencies developed at the introductory level and focus on developing more complex competencies. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Module DES2010: 2-D Design Applications E.3
Module DES2020: 3-D Design Applications E.7
Module DES2030: CAD Applications (Computer-aided Design) E.11
Module DES2040: Drafting/Design Applications E.13
Module DES2050: Technical Drawing Applications E.17
Module DES2060: The Evolution of Design E.21

MODULE DES2010: 2-D DESIGN APPLICATIONS

Level: Intermediate

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply the design process and other knowledge, skills and processes learned at the introductory level to two-dimensional design projects. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module Parameters: Basic sketching, drawing and graphic layout tools and equipment and/or a computer with graphic design software.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in graphic design.

Supporting Modules: DES1020 The Design Process

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• plan and produce solutions to intermediate level two-dimensional design briefs	• resolution of a teacher- and/or student-specified intermediate level two-dimensional design brief. *Assessment Tool* *Project Assessment: Design Skills, Processes and Applications (Intermediate) (DESPRJ–2A)* *Standard* *Performance rating of 1 for each criteria*	60
• use, effectively, the elements and principles of design	• selection and effective use of elements and principles of design in project work. *Assessment Tools* *Authorized resources for explanation and examples of elements and principles of design* *Project Assessment: Design Skills, Processes and Applications (Intermediate) (DESPRJ–2A)* *Standard* *Performance rating of 1 for each criteria*	20

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – the aesthetic quality of the product – the process(es), tools, materials and techniques used in resolving the design brief – why these were chosen – to what effect they were used. *Assessment Tools* *Presentations/Reports: Design Skills, Processes and Applications (Intermediate) (DESPRE–2A)* *Standard* *Performance rating of 2 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• demonstrate proficiency with skills and techniques learned at the introductory level; e.g., practising sketching and drawing • identify additional techniques, tools, materials and other resources (e.g., tones, texture and colour; markers and paints; photographs and illustrations; computer generated or captured images; type faces) and use them in design projects • write a design brief and/or structure a plan for resolving a two-dimensional design project(s) • demonstrate organization and management of personal learning with limited external direction	Students can expand their knowledge of two-dimensional design in part through exposure to a wider selection of materials, tools and techniques. They must, however, solidify and increase their abilities with previously learned/ used materials, tools and techniques. It may be best to reinforce existing practices and add new learning where appropriate.

MODULE DES2010: 2-D DESIGN APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:* • identify mathematical and/or scientific principles as they apply to design projects assigned; e.g., organization of visual space, measurement of internal space, borders, columns, use of scale.	Students should learn to write design briefs and structure plans for resolving the brief. Briefs and plans may be based on teacher- or student-identified needs. Students will learn to prepare briefs and plans, and manage their own learning at this level, and to do so independently at the advanced level. Many design solutions will not be completed full size but will be "scale" models. For example, a student might prepare a scale module of a mural that could be painted on a building. Students can learn the concept of scale in this context then apply it repeatedly in other design tasks.
Elements and Principles of Design	• use elements and principles of design in design projects • experiment with one or more elements (e.g., colour, line, shape) and/or principles (e.g., rhythm, balance) to achieve desired affects.	
Applied Problem Solving	• follow through a design process to solve two-dimensional design problems; e.g., CD covers, sports graphics, newspaper or magazine advertisements, billboards or wall murals, corporate logos or neon graphics • select and use appropriate tools and materials as outlined in the design brief.	Intermediate level Design Studies students must take a problem as given, generate ideas for a solution and work them through. Teachers will need to teach more advanced techniques, or direct their students to appropriate resources, but the responsibility for problem solving should rest with the student.

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	*The student should:* • participate in interim critiques that include peer review and input • prepare for and actively participate in a final presentation and critique of design work. Effectively communicate intentions and decision making related to the design project • maintain a design journal/sketchbook of the project, which would include research notes, ideas, writings, sketches, photographs, cuttings, etc., related to the project • maintain a portfolio of ongoing design activity, which might include sketches, freehand drawings, rendered drawings, technical drawings, photographs of models (physical and/or CAD), reports, etc., plus work from previously completed modules.	Students working at this level should be able to present their work to their classmates in informal critique sessions. Critiques of completed projects provide a venue for students to present their work and to celebrate their success with their peers. Participation guidelines should be established and clearly understood by students before a critique occurs. Students who have taken several modules and have maintained a portfolio will have a sizable collection of design projects. They may begin culling some less successful projects in favour of newer projects showing more advanced learning. An alternative would be to start a second portfolio of presentation quality pieces while maintaining a working portfolio.

MODULE DES2020: 3-D DESIGN APPLICATIONS

Level: Intermediate

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply the design process and other knowledge, skills and processes learned at the introductory level to three-dimensional design projects. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module Parameters: Basic sketching, drawing and modelling tools and equipment and/or a computer. Specialized facilities or equipment depend on the approach taken to 3-D model development.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in product or industrial design.

Supporting Module: DES1020 The Design Process

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• plan and produce solutions to intermediate level three-dimensional design briefs	• resolution of a teacher- and/or student-specified intermediate level three-dimensional project brief(s). *Assessment Tool* *Project Assessment: Design Skills, Processes and Applications (Intermediate) (DESPRJ–2A)* *Standard* *Performance rating of 1 for each criteria*	60
• use, effectively, the elements and principles of design	• selection and effective use of elements and principles of design in project work. *Assessment Tool* *Project Assessment: Design Skills, Processes and Applications (Intermediate) (DESPRJ–2A)* *Standard* *Performance rating of 1 for each criteria*	20

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MODULE DES2020: 3-D DESIGN APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – the aesthetic quality of the product – the process(es), tools, materials and techniques used in resolving the design brief – why these were chosen – to what effect they were used. *Assessment Tool* *Presentations/Reports: Design Skills, Processes and Applications (Intermediate) (DESPRE–2A)* *Standard* *Performance rating of 2 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• demonstrate increased proficiency with skills and techniques learned at the introductory level; e.g., cutting, joining, bending, measuring • identify additional techniques, tools, materials and other resources (e.g., materials such as woods, metals, plastics, fibres, techniques specific to cutting, joining or bending materials not used before, tools specific to these activities) and use them in design projects • write a design brief and/or structure a plan for resolving a three-dimensional design project(s) • demonstrate organization and management of personal learning with limited external direction	See the notes from 2-D Design Applications as they apply equally to this module. Scientific principles are applied continually in three-dimensional design. Recognizing these principles and how they may be applied will advance students' knowledge and ability in design and provide practical uses for theoretical constructs learned in other programs.

MODULE DES2020: 3-D DESIGN APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:* • identify mathematical and/or scientific principles as they apply to design projects assigned; e.g., structural principles applied to strength and stability, principles of mass and buoyancy applied to flotation; principles of energy and control as applied to movement and power.	
Elements and Principles of Design	• use elements and principles of design in design projects.	It is important for students to experiment with form; the form of objects and the space they occupy.
Applied Problem Solving	• follow through a design process to solve three-dimensional design problems(s); e.g., a toy made of wood or fabric for a preschool child, a sustained motion machine, a "boat" made of wood, paper, glue and shellac or a seat for a patio or garden • select and use appropriate tools and materials as outlined in the design brief.	Students should examine various types of structures and the principles they are based on. They will learn why some structures are successful while others fail. This knowledge can then be applied to their design tasks. Scale models may be produced in this module. For example, a student may produce a scale model of a chair, a catapult or a bridge. The model could be tested for strength and durability, then if appropriate, a final prototype could be produced.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations from 2-D Design Applications.	See notes from 2-D Design Applications.

MODULE DES2030: CAD APPLICATIONS (COMPUTER-AIDED DESIGN)

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students apply their previous learnings, and add knowledge, skills and techniques associated with computer-aided design (CAD) to the context of new design-related tasks.

Module Parameters: Access to a computer with a computer-aided design (CAD) software package, a printer and/or plotter, and basic sketching and drawing tools and equipment.
Note: It is recommended that students have access to instruction from an individual with formal specialized training in a design discipline, drafting and CAD.

Supporting Modules: DES1050 CAD Fundamentals

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• use CAD software to produce and print/plot intermediate level multiview and/or pictorial drawings and/or surface developments	• production of a multiview and/or pictorial drawing and/or surface development using teacher-specified CAD software. *Assessment Tool* *Project Assessment: CAD Applications (DES2030–1)* *Standard* *Performance rating of 1 for each criteria*	80
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the accuracy of application of the CAD software to the drawing assignment, and the student's discourse regarding the process(es), tools and functions used in producing his or her drawing. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Intermediate) (DESPRE–2B)* *Standard* *Performance rating of 2 for each criteria*	20

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • identify and demonstrate commonly used tools, methods and functions (see CAD Fundamentals) without teacher direction and assistance • read and interpret pictorial and other types of sketches for pertinent information • use CAD skills to produce layered fully dimensioned multiview drawings and pictorial drawings and/or surface developments • print or plot drawings.	Students completing this module should be fully versed in basic CAD use. Teachers may provide students with experience on other computer software that links to and/or supports CAD.
Applied Problem Solving	• select and use CAD tools, methods and functions to produce layered multiview drawings and pictorial drawings and/or surface developments based on pictorial sketches or real three-dimensional objects • demonstrate the use of layers on at least one drawing.	As with CAD Fundamentals, applied problem solving in this module centres on the student's ability to select appropriate tools, methods and functions for achieving specific tasks.
Presentation, Design Journal and Portfolio	• print/plot drawings and include them in a portfolio • explain drawings as required (e.g., technique/ application used, purpose of element in the drawing, terminology).	A critique in this module may emphasize sharing information about CAD rather than solutions to design problems. Specific project activities should concentrate on skill development with a specific CAD package.

MODULE DES2040: DRAFTING/DESIGN APPLICATIONS

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students learn skills in assembly, section and/or auxiliary drawing. They further develop the knowledge, skills and techniques; e.g., pictorial drawings, multiview drawings, surface developments (flat patterns), and by applying them in the context of more complex design projects.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or computer with a computer-aided design (CAD) software package, a printer and/or plotter.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and where applicable in CAD.

Supporting Module: DES1060 Drafting/Design Fundamentals

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • produce pictorial drawings; e.g., isometric, oblique, one- and two-point perspective using rendering styles and techniques; e.g., pencil, ink, colour, computer generated within the context of design projects	*Assessment of student achievement should be based on:* • production of pictorial drawings and renderings within the context of a teacher- and/or student-specified design assignments. *Assessment Tool* *Project Assessment: Drafting/Design Applications (DES2040–1)* *Standard* *Performance rating of 1 for each criteria*	40

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MODULE DES2040: DRAFTING/DESIGN APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce at least two types of drawings chosen from assembly, section or auxiliary, either manually or with the aid of a computer	• production of two of the following based on teacher- and/or student-specified three-dimensional references and/or sketches and aided by mechanical drafting equipment or CAD software and describing their purpose and application: – assembly drawing – section drawing – auxiliary drawing	30
• produce dimensioned multiview drawings, either manually or with the aid of a computer OR • produce surface developments for items; e.g., garments, sheet metal, packaging, manually or with the aid of a computer	• production of the following based on teacher- and/or student-specified three-dimensional references and/or sketches and aided by mechanical drafting equipment or CAD software: – dimensioned multiview drawing(s) or – surface development(s) for construction. *Assessment Tool* *Project Assessment: Drafting/Design Applications (DES2040–1)* *Standard* *Performance rating of 1 for each criteria*	10
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the student's discourse, emphasizing: – his or her understanding of pictorial drawing and rendering styles and techniques – how these can be used – how these were applied in the drawings produced – and understanding of multiview drawings, their preparation and use. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Intermediate) (DESPRE–2B)* *Standard* *Performance rating of 2 for each criteria*	20

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MODULE DES2040: DRAFTING/DESIGN APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • demonstrate increased skills in pictorial drawing and/or in producing surface development drawings (flat patterns) • produce at least two examples chosen from the following drawings types: assembly, sectional, or auxiliary; and be able to describe their purpose and application within a design project • use appropriate terminology within the context of each design project • produce one or more multiview drawing(s) (at least three views) of a product, structure or devise, etc. OR • produce at least two surface developments chosen from the following: – a package – a fold-up model – a garment – ventilation ducting – a container – a collapsible shelter – other teacher-specified project(s).	In this module, students should engage in a variety of activities that involve generating drawings based in a design problem. The specific skills should be taught within this context. Some teachers may take a single theme (e.g., lake cottage, all-terrain vehicle or garment) as the context for learning. Other teachers will want their students to engage in two or more smaller projects. Students need to be able to communicate in a common language. Learning specific terminology associated with this area will help the students communicate effectively to each other and to outside parties.

MODULE DES2040: DRAFTING/DESIGN APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • select appropriate drawing types and styles and use them to accurately illustrate potential design solutions as part of the resolution of a design brief • select and use appropriate tools and materials as outlined in each design brief.	Students may use this module in several contexts including architecture, landscape design, product design, and flat pattern design for fashion. Students may use traditional drafting equipment, CAD or other technology specified by the teacher to complete the module. Students may need guidance in choosing appropriate drawing types and approaches for the design project(s) they engage in.
Presentation, Design Journal and Portfolio	• print/plot drawings and include them in a design portfolio • explain drawings as required (e.g., pictorial/ multiview drawing styles and techniques, drawing preparation, drawing use).	See notes for 2-D Design Applications and CAD Applications.

MODULE DES2050: TECHNICAL DRAWING APPLICATIONS

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment facilities depend on the approach taken.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and where applicable in CAD.

Supporting Modules: DES1060 Drafting/Design Fundamentals

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce technical drawings for simple structures, products and/or components	• set of technical drawings for a simple structure and/or a product and/or a manufactured component. *Assessment Tool* *Project Assessment: Technical Drawing Applications (DES2050–1)* *Standard* *Performance rating of 1 for each criteria*	60
• dimension and notate drawings accurately	• accurate dimensioning and notation of all drawings in accordance with standards and conventions. *Assessment Tool* *Project Assessment: Technical Drawing Applications (DES2050–1)* *Standard* *Performance rating of 1 for each criteria*	10

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MODULE DES2050: TECHNICAL DRAWING APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify and include to all pertinent codes and specifications as they apply to drawings produced	• identification and application of codes and specifications as they pertain to the project and as determined by the teacher and/or other qualified individual. *Assessment Tool* *Local, regional, provincial, national and international reference manuals for codes and standards* *Project Assessment: Technical Drawing Applications (DES2050–1)* *Standard* *Performance rating of 1 for each criteria*	10
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on: – the quality and accuracy of the drawings produced, and the student's discourse, emphasizing: • his or her understanding of technical drawing techniques • how these were applied in the drawings produced • the codes and specifications addressed in the drawings. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Intermediate) (DESPRE–2B)* *Standard* *Performance rating of 2 for each criteria*	20

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe the need for specific types of drawings (e.g., detail, assembly, sectional, auxiliary, exploded view) and where and when they are used • produce at least one example of each of the following drawings based on sketches provided and accurately dimension and notate each drawing: – multiview drawing (showing a minimum of three views) – a detail and/or assembly drawing – a sectional and/or auxiliary drawing – exploded view and/or threaded fastener	The focus of this module is to teach students basic technical drawing skills so they may prepare working drawings for the purpose of manufacturing construction and fabrication structures, products and systems. Students may use traditional drafting equipment, CAD or other technologies specified by the teacher to complete this module.

MODULE DES2050: TECHNICAL DRAWING APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development (continued)	• produce a pictorial drawing (isometric or oblique or perspective) of the object represented in the multiview drawing • demonstrate standard conventions of technical drawing (e.g., title blocks, labelling/lettering, dimensioning, scale and measuring, line types such as solid, hidden, projection, break, fold, phantom) as appropriate in drawings being completed • interpret standards and codes as they apply to the drawings being done • use appropriate terminology.	This is a skill development module that supports the Drafting/Design Fundamentals, 3-D Design and Living Environments foci in Design Studies. The Drafting/Design and Technical Drawing modules also support CAD skills modules and modules from strands involved in manufacturing, construction and fabrication (e.g., Construction Technologies, Fabrication Studies, Fashion Studies, Communication Technology). Teachers may wish to contextualize the work done in this module in one of these areas.
Presentation, Design Journal and Portfolio	• see Specific Learning Expectations for 2-D Design Applications and CAD Applications.	See notes for 2-D Design Applications and CAD Applications.

MODULE DES2060: THE EVOLUTION OF DESIGN

Level: Intermediate

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students develop a historical framework for the importance and relevance of design within a cultural context, by examining past and contemporary examples of designed artifacts.

Module Parameters: No specialized equipment or facilities.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• demonstrate knowledge of historical and contemporary design resources	• demonstration of a general knowledge of the evolution of design through project work. *Assessment Tool* *Project Assessment: The Evolution of Design (DES2060–1)* *Standard* *Performance rating of 2 for each criteria*	40
• make a formal presentation of research findings	• formal presentation to teachers and peer(s) of research findings in one area of historical or contemporary design. *Assessment Tool* *Presentations/Reports: The Evolution of Design (DES2060–2)* *Standard* *Performance rating of 2 for each criteria*	40
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the quality and accuracy of the research. *Assessment Tool* *Presentations/Reports: The Evolution of Design (DES2060–2)* *Standard* *Performance rating of 2 for each criteria*	20

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MODULE DES2060: THE EVOLUTION OF DESIGN (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe historical influences in design • identify and explain the relationship between a design solution in the past and a current design solution (e.g., buildings, graphics, fashion and transportation) including the influence of cultural, global, ethical and environmental conditions on the solution.	This module helps students explore different avenues of design by examining the work of designers through history. Several different approaches may be taken. For example, students might study the work of a designer working today and compare it with the work of a designer from the 1930s; they might take an old artifact and try to reproduce it; they might follow the development of a particular product, process or system (e.g., brewing coffee or the development of plastic) through history to the present day. Students need to consider the influences of cultural, ethical, social and/or environmental conditions on design. The point of the module is to give students a larger sense of design.

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • prepare a presentation of research findings; e.g., a research paper, a media presentation • use tools, materials and other resources appropriate for the presentation; e.g., video equipment, computers, still cameras, projectors, display materials.	Students might design their presentation in several different ways including reproducing a scale model of an artifact designed and used in the past or sequential drawings, or photographs of an object that has evolved over time, presentation panels depicting "designed" artifacts from a particular culture, sets for a "period" drama or a term paper on a selected topic.
Presentation, Design Journal and Portfolio	• present in interim findings for teacher/peer review and input • prepare for and actively participate in a final presentation and critique describing the area of study and findings • maintain a design journal/sketchbook of the project including research notes, ideas, writings, sketches, photographs, cuttings, etc., related to the project • add notes, research documentation and presentation material to his or her portfolio of work from previously completed modules.	See notes from 2-D Design Applications.

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION F: ADVANCED LEVEL

The following pages define the curriculum and assessment standards for the advanced level of Design Studies.

Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

Module DES3010: 2-D Design Studio 1 ..... F.3
Module DES3020: 2-D Design Studio 2 ..... F.7
Module DES3030: 2-D Design Studio 3 ..... F.11
Module DES3040: 3-D Design Studio 1 ..... F.15
Module DES3050: 3-D Design Studio 2 ..... F.19
Module DES3060: 3-D Design Studio 3 ..... F.23
Module DES3070: Living Environment Studio 1 ..... F.27
Module DES3080: Living Environment Studio 2 ..... F.31
Module DES3090: Living Environment Studio 3 ..... F.35
Module DES3100: CAD Modelling Studio (Computer-aided Design) F.39
Module DES3110: Drafting/Design Studio 1 ..... F.43
Module DES3120: Drafting/Design Studio 2 ..... F.47
Module DES3130: Drafting/Design Studio 3 ..... F.51
Module DES3140: Technical Drawing Studio 1 ..... F.55
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Module DES3160: Technical Drawing Studio 3 ..... F.63
Module DES3170: Visualizing the Future F.67
Module DES3180: The Design Profession F.71
Module DES3190: Portfolio Presentation F.75

MODULE DES3010: 2-D DESIGN STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics of communication design solutions.

Module Parameters: Sketching, drawing and graphic layout tools and equipment and/or a computer with graphic design software.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in graphic design and production.

Supporting Module: DES2010 2-D Design Applications

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce advanced level designed solutions for two-dimensional design problems	• resolution of a teacher-approved, student-specified advanced level two-dimensional design brief. *Assessment Tool* *Project Assessment: Form, Composition and Aesthetics (DESPRJ–3A)* *Standard* *Performance rating of 2 for each criteria*	50
• apply elements and principles of design to two-dimensional design compositions	• selection and effective use of elements and principles of design in project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principles of design* *Project Assessment: Form, Composition and Aesthetics (DESPRJ–3A)* *Standard* *Performance rating of 2 for each criteria*	20

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MODULE DES3010: 2-D DESIGN STUDIO 1 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• make rational judgments for achieving aesthetic quality in two-dimensional design solutions	• justification and judgements made during designing with respect to aesthetics, brought forth within the presentation/critique. *Assessment Tool* *Presentations/Reports: Form, Composition, and Aesthetics (Advanced) (DESPRE–3A)* *Standard* *Performance rating of 2 for each criteria*	10
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: – the form, composition and aesthetic quality of the product – the judgements made during the designing process, – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Form, Composition, and Aesthetics (Advanced) (DESPRE–3A)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • demonstrate increased proficiency with skills and techniques learned at the introductory and intermediate levels • identify and use additional techniques, tools, materials and other resources as required in projects undertaken • demonstrate organization and management of personal learning without external direction, in both individual and cooperative learning situations • demonstrate increased group work skills.	
Elements and Principles of Design	• identify the elements and principles of design used in the solution of each design problem and explain how their use has contributed to the aesthetics and function of the solution	Students must be able to identify the elements and principles of design and use them effectively in resolving design tasks. It is important that they recognize how they can use the elements and principles to their best advantage.
	• rationalize decisions made during designing and indicate how these decisions affected the aesthetic quality of the solution.	Decision making is central to successful design. Students at this level must make decisions and learn from the results.
Applied Problem Solving	• solve one or more two-dimensional design problems; e.g., displays/exhibits, packaging graphics, textiles, advertising, murals, signage, posters, calendars, billboards, maps and charts • identify each problem, write a design brief and structure a plan for resolution • select and use appropriate tools and materials as outlined in the design brief.	Some students may take on a project of greater magnitude and therefore would not be required to complete more than one project in this module. Some students may also engage in large-scale projects that require more than one module to complete.

MODULE DES3010: 2-D DESIGN STUDIO 1 (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving (continued)	*The student should:*	Advanced level students must be able to write out project briefs for themselves and others. They must be able to organize their work, select appropriate tools, equipment, materials, etc., to make the project successful. It is important that they be given responsibility for their learning and that the teacher is there to support them and provide guidance where necessary.
Presentation, Design Journal and Portfolio	• participate in interim and final critiques meeting or exceeding the expectations of intermediate level modules • lead at least one interim or final critique at the advanced level • maintain journal/sketchbook as described in The Design Process • maintain a portfolio of ongoing design activity including all projected related material in two-dimensional design (see 2-D Design Applications), the design journal, and appropriate supplementary material • independently update portfolio, assessing portfolio for extraneous material (see 2-D Design Applications).	Advanced students should be able to lead a critique session. They should be given opportunity to do so at some point in their advanced level program.

MODULE DES3020: 2-D DESIGN STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students investigate the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and apply this information when resolving complex communication design problems.

Module Parameters: Sketching, drawing and graphic layout tools and equipment and/or a computer with graphic design software.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in graphic design and production.

Supporting Module: DES3010 2-D Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce advanced level designed solutions for two-dimensional communication design problems	• resolution of a teacher-approved, student-specified advanced level two-dimensional design brief. *Assessment Tool* *Project Assessment: Communication and Human Factors (DESPRJ–3B)* *Standard* *Performance rating of 2 for each criteria*	50
• identify examples of effective and ineffective two-dimensional designs	• constructive analysis and criticism of two-dimensional design work of varying quality gathered from real world context. *Assessment Tool* *Project Assessment: Communication and Human Factors (DESPRJ–3B)* *Standard* *Performance rating of 2 for each criteria*	10

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MODULE DES3020: 2-D DESIGN STUDIO 2 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• **identify human factors commonly affected by two-dimensional design solutions and accommodate these within designed solutions**	• written or verbal identification of human factors commonly addressed in two-dimensional design, and the degree to which these are accommodated in the resolved project brief. *Assessment Tool* *Project Assessment: Communication and Human Factors (DESPRJ–3B)* *Standard* *Performance rating of 2 for each criteria*	20
• **select, organize and present design projects**	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: – the effectiveness of the designed solution in communicating its message – the degree to which the designed solution addresses identified human factors. *Assessment Tool* *Presentations/Reports: Communication and Human Factors (Advanced), (DESPRE–3B)* *Standard* *Performance rating of 3 for each criteria*	20
• **demonstrate basic competencies.**	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES3020: 2-D DESIGN STUDIO 2 (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • identify and select examples of "designed" communication and make judgements as to their effectiveness • select at least three examples of commercially generated two-dimensional design and describe the impact of the examples on himself or herself; e.g., social/psychological impact, impact on himself or herself as a human being, how he or she feels about the design • describe at least three ways human factors (e.g., physical, mental, ethical, cultural) can affect two-dimensional design; e.g., use of colour, cultural symbolism, response to size, shape, prominence.	Advanced level students must be able to determine levels of quality. They must apply this knowledge in their own design work. Design is done for a purpose—to meet a client's need. It is important that students realize that not all designed ideas work. It is also crucial that students recognize the relationship of design to the human condition and the impact design can have on them and others, socially, psychologically and emotionally as well as physically. Designed items (e.g., communication systems, products) have a great impact on people. Students must recognize this, both as designers and as consumers of design. This study relates very closely to notions of consumerism and the place of design in a "consumer" society.
Applied Problem Solving	• solve at least two different two-dimensional design problems involving communication; e.g., signs, advertising layouts, maps, packaging graphics, fabric motifs, flow diagrams, assembly drawings, cutting layouts, organizational charts • identify each problem, write a project brief and structure a plan for resolution • select and use appropriate tools and materials as outlined in each project brief.	Students may engage in new projects or continue projects begun in 2-D Design Studio 1. See this module for additional notes.

MODULE DES3020: 2-D DESIGN STUDIO 2 (continued)

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	*The student should:* • see Specific Learner Expectations for 2-D Design Studio 1.	See notes from 2-D Design Studio 1.

MODULE DES3030: 2-D DESIGN STUDIO 3

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students explore the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied in the resolution of complex two-dimensional design problems.

Module Parameters: Sketching, drawing and graphic layout tools and equipment and/or a computer with graphic design software.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in graphic design and production.

Supporting Module: DES3010 2-D Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce advanced level designed solutions for two-dimensional design problems involving materials and production processes	• resolution of a teacher-approved, student-specified advanced level two-dimensional design brief. *Assessment Tool* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	40
• select materials based on their properties and justify their use in the context of two-dimensional design; e.g., what works in a given situation to achieve a desired affect	• justification of selection of materials used in resolving design brief, brought forth within the presentation/critique. *Assessment Tool* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	10

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• design and/or select and use a process to reproduce a two-dimensional product in quantity	• reproduction of a two-dimensional product in quantity (i.e., at least five copies) using a production process. *Assessment Tool* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	30
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the quality of the reproduced product, and the student's discourse regarding: – the justification for the selection and use of materials for the designed solution – the strengths and weaknesses of the design and/or selected process used to reproduce the product. *Assessment Tool* *Presentations/Reports: Materials and Production Processes (Advanced) (DESPRE–3C)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES3030: 2-D DESIGN STUDIO 3 (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • select, organize and manage a production team • prepare a written submission describing the production process used, indicating key elements of that process and the management task (optionally supported by illustrations, photographs, etc.).	Some students will be natural organizers and managers while others will need to learn these skills. Taking on different collaborative roles will help students recognize their ability and the areas requiring development.
Applied Problem Solving	• solve a design problem involving the production of a designed product in quantity • identify the problem, write a project brief and prepare a plan for resolution • select and use appropriate tools and materials as outlined in the project brief • rationalize the selection of materials used in the design project based on their physical properties.	Some students may want to produce several simple products; others may want to produce a single, more complex product. Advanced level students must be able to select and use appropriate materials and equipment and rationalize their selection.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • maintain a portfolio of ongoing design activity, which might in this module include samples of items reproduced as part of the module activity (e.g., actual items, photographs or video of item in production and final product, written submission detailing production activity) and appropriate supplementary material.	See notes from other 2-D Design Studio modules.

MODULE DES3040: 3-D DESIGN STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

Module Parameters: Sketching, drawing and modelling tools and equipment and access to a computer. Specialized facilities or equipment depend on the approach taken to 3-D model development and mass production.
Note: It is recommended that students have access to instruction from an individual with formal, specialized training in product or industrial design and production.

Supporting Module: DES2020 3-D Design Applications

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
- produce advanced level designed solutions for three-dimensional design problems	- resolution of a teacher-approved, student-specified advanced level three-dimensional design brief. *Assessment Tool* *Project Assessment: Form, Composition and Aesthetics (DESPRJ–3A)* *Standard* *Performance rating of 2 for each criteria*	30
- use elements, principles, and considerations common to three-dimensional compositions	- selection and effective use of elements and principles of design in project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principle of design* *Project Assessment: Form, Composition and Aesthetics (DESPRJ–3A)* *Standard* *Performance rating of 2 for each criteria*	20

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• use various materials, and the required processes to shape and join such materials, and to create desired forms	• selection and effective use of materials and associated processes in project work. *Assessment Tool* *Authorized resources for examples of materials, and processes used to shape and join them* *Project Assessment: Form, Composition and Esthetics (DESPRJ–3A)* *Standard* *Performance rating of 2 for each criteria*	10
• demonstrate familiarity with symbolic and cultural connotations of design, and make aesthetic judgments about design solutions generated	• justification of judgements made during designing with respect to aesthetics, symbolism and culture, brought forth within the presentation/critique. *Assessment Tool* *Presentations/Reports Form, Composition, and Aesthetics (Advanced) (DESPRE–3A)* *Standard* *Performance rating of 2 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – the form, composition and aesthetic quality of the product – the judgements made during the designing process – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports Form, Composition, and Aesthetics (Advanced) (DESPRE–3A)* *Standard* *Performance rating of 3 for each criteria*	20

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe through project work the relationship between the technical/analytical requirements of a project (function) and the more subjective/ intuitive judgements that effect project aesthetics (form) • explain how this understanding has shaped both the designing process and the design solution.	Designs must be both functional and aesthetically pleasing. Understanding this interrelationship will help students design solutions that work and are at the same time elegant. It will also help them select processes and materials that are best suited to their designed solution.
Elements and Principles	• identify the considerations, decisions, elements and principles of the designing process that contributed to the design solution • explain these through verbal and/or written presentation.	See notes from 2-D Design Studio modules.

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • analyze one or more three-dimensional design projects; e.g., displays, exhibits, dramatic sets, products, packaging, furniture, lighting, CD players • identify each problem through background research and general familiarization, write a project brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, steps required to achieve the objectives, the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a simple bar chart) • select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the project brief.	In early stages of a project, the designing process might include sketching in two-dimensions and sketch-modelling in three dimensions to explore possibilities of form and composition in the context of the project brief. Later in the project, CAD drawings could be used to define the design and facilitate construction. Three-dimensional physical models (or in some cases, possibly CAD models) might be used to visualize the final design solution in order to deal more fully with detailing and overall aesthetics. Rendered drawings could be used to explore colour options and combinations. However, design problem solving is rarely a linear process and iterations will often continue into the final stages of the project. See notes from 2-D Design Studio modules.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • maintain a portfolio of ongoing design activity, which in this module would include samples of items produced and/or photographs or video of items produced.	See notes from 2-D Design Studio modules.

MODULE DES3050: 3-D DESIGN STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students are introduced to human factors, principles and considerations; e.g., ergonomics, semantics and semiotics.

Module Parameters: Specialized facilities or equipment may be required depending on the approach taken to 3-D model development and mass production. Sketching, drawing and modelling tools and equipment and access to a computer.
Note: It is recommended that students have access to instruction from an individual with formal, specialized training in product or industrial design and production.

Supporting Module: DES3040 3-D Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• apply human factors, principles and considerations; i.e., physical, auditory, visual when designing, which results in a three-dimensional product for human use	• resolution of a teacher- and/or student-specified advanced level three-dimensional project brief. *Assessment Tool* *Project Assessment: Communication and Human Factors (DESPRJ–3B)* *Standard* *Performance rating of 2 for each criteria*	60
• explain the relationships among the application of human factors, principles and considerations and the articulation (system, sequence) of a product design	• justification of judgements made during designing with respect to human factors and the designed solution, brought forth within the presentation/critique. *Assessment Tool* *Project Assessment: Communication and Human Factors (DESPRJ–3B)* *Standard* *Performance rating of 2 for each criteria*	20

MODULE DES3050: 3-D DESIGN STUDIO 2 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: – the form, composition and aesthetic quality of the product – the judgments made during the designing process, – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports Communication and Human Factors (Advanced) (DESPRE-3B)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• select at least three examples of commercially produced products and consider, analyze and describe the human factors aspects of the designs. Identify the elements that are judged to be appropriately resolved in the designs, and those that could be improved. Make suggestions for how improvements could be affected	Design is done for a purpose. It is important that students realize that products are designed to meet a client's needs. Well-designed products will have a greater chance of success than poorly designed products. Students must recognize this, both as designers and as consumers of design.
	• provide at least three examples of how human factors (e.g., physical, mental, emotional, psychological, ethical cultural) can affect three-dimensional design; e.g., size of products in relation to human anatomy, toys or games of different materials or with different levels of complexity depending on the intended age group, the shape or orientation of a building and its relationship to cultural conventions and expectations.	The impact of design on the social, psychological, emotional and physical well-being of people must be recognized by students and taken into account in their design work.
Applied Problem Solving	• analyze one or more three-dimensional design projects; e.g., furniture, hand-tools, interfaces for electronic equipment (e.g., for a photocopier, a radio or personal stereo), control design (e.g., for a shower), design for users with special needs (e.g., seniors, wheelchair users, extraordinary work environment), signage, eye glasses, clothes, shoes, toys, board games, sports equipment, architectural elements, such as entrances, public/private spaces	See notes from 2-D Design Studio modules.
	• identify the human factors considerations to be addressed, write a design brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, steps required to achieve the objectives (which might include user testing of ideas with a survey group), the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a bar chart)	

Concept	Specific Learner Expectations	Notes
Applied Problem Solving (continued)	*The student should:* • select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the design brief.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and 3-D Design Studio 1.	Advanced students should be able to lead a critique session. They should be given opportunity to do so at some point in their advanced level program.

MODULE DES3060: **3-D DESIGN STUDIO 3**

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students expand their knowledge of materials, technologies and production/processes employed to shape and join materials and assemble products. Students will become familiar with principles of manufacturing, and materials, technologies and processes appropriate to manufacturing a product in various production quantities.

Module Parameters: Sketching, drawing and modelling tools and equipment and access to a computer. Specialized facilities or equipment depend on the approach taken to 3-D model development and mass production.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in product or industrial design and production.

Supporting Module: DES3040 3-D Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• use materials, technologies and production processes relevant to a particular area of three-dimensional design to produce a product	• resolution of a teacher-approved, student-specified advanced level three-dimensional design brief. *Assessment Tool* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	40
• apply appropriate materials and processes to form, shape, join, fasten, assemble and/or construct with various materials based on their properties on advanced level three-dimensional project	• selection and effective use of materials and associated processes in project work. *Assessment Tool* *Authorized resources for examples of materials, and processes used to shape and join them* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	20

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MODULE DES3060: 3-D DESIGN STUDIO 3 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• describe the relationship among materials, production processes and intended production quantities, and the manner in which a product is designed	• justification of the selection/recommendation of materials and production processes, and the proposed quantities to be reproduced, brought forth within the presentation/critique. *Assessment Tool* *Project Assessment: Materials and Production Processes (DESPRJ–3C)* *Standard* *Performance rating of 2 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the quality of the product, and the student's discourse regarding: – the strengths and weaknesses of the designed solution – the justification for the selection and use of materials for the designed solution, recommendation for production process(es) and quantities to be reproduced. *Assessment Tool* *Presentations/Reports Materials and Production Processes (Advanced) (DESPRE–3C)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

MODULE DES3060: 3-D DESIGN STUDIO 3 (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • select an appropriate production process for the design proposal. Study and describe the stages in the production system, the roles of the various members of the production team that contribute to the process; e.g., economists, engineers, production managers, marketing specialists • describe the organizational and management aspects that are required to put a product into production.	
Applied Problem Solving	• complete a project that requires the design of a product for quantity production ("quantity" could range from 5 products to >10,000 products depending on the nature of the projects). The materials and processes selected will be dependent on the intended quantities to be (theoretically) produced; e.g., furniture, kitchen appliances, electronic products, jewellery, clothing, architectural elements, such as moldings, fittings and fixtures, toys, sports equipment • identify the materials and production considerations to be addressed, write a design brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, intended production quantities, steps required to achieve the objectives (which might include consultations with manufacturers), the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a bar chart) • select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the project brief	The processes used to produce products are many and varied. It is important that students understand that product manufacturing is a system of occurrences that are "designed." By studying various manufacturing processes, students will see how a product is manufactured, the steps within the system and the impact on the materials used in the process. They must also consider the environmental impact of the process. It may be possible for students to test various materials as part of their selection process. It may be possible for students to visit a manufacturing site or to simulate a manufacturing situation.

Concept	Specific Learner Expectations	Notes
Applied Problem Solving (continued)	*The student should:* • rationalize the selection of materials used in the design based on their physical properties, the intended quantities to be produced, the relationship to the project requirements and the production processes specified. Describe alternative materials and processes that might be appropriate for the production of the design in smaller and/or larger quantities.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and 2-D Design 3.	

MODULE DES3070: LIVING ENVIRONMENT STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students learn to develop appropriate architectural, environmental or interior design solutions for specific human needs. Students also learn to use design methodology and teamwork in the development of such solutions.

Module Parameters: Sketching, drawing and modelling tools and equipment and access to a computer. Specialized facilities or equipment depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in architectural, interior and/or environmental design.

Supporting Module: DES1020 The Design Process

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce creative designed solutions based in architectural, environmental and/or interior design, that address human and/or environmental needs	• resolution of a teacher-approved, student-specified advanced level Living Environment design brief. *Assessment Tool* *Project Assessment: Living Environment Studio 1 (DES3070–1)* *Standard* *Performance rating of 2 for each criteria*	50
• use elements, principles and processes of design to deal with identified human and/or environmental needs within design solutions	• selection and effective use of elements and principles of design in project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principles of design* *Project Assessment: Living Environment Studio 1 (DES3070–1)* *Standard* *Performance rating of 2 for each criteria*	10

MODULE DES3070: LIVING ENVIRONMENT STUDIO 1 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• describe how human and environmental requirements affect design	• presentation of ideas on the relationship of human and environmental needs and design through writing and/or through discourse during the presentation/critique. *Assessment Tool* *Presentations/Reports: Living Environment Studio (Advanced) (DESPRE–3D)* *Standard* *Performance rating of 3 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: – how human and environmental needs have been addressed through the designed solution – the judgements made during the designing process, – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Living Environment Studio (Advanced) (DESPRE–3D)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES3070: LIVING ENVIRONMENT STUDIO 1 (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe how the environment has a direct impact in design; e.g., extreme climates, delicate environments, toxic environments • present at least three examples of the impact of a living environment on human beings; e.g., the impact of different parts of the school on what people are able to do, different behavioural responses to the atmosphere of a fast food restaurant and a formal dining restaurant, the effect of different types of furniture on a person's activity level • provide at least three examples of how human factors (e.g., physical, mental, ethical, culture) can affect architectural, environmental or interior design (e.g., size of doorways, temperature controls, colour selections • describe the responsibility design has toward the human and natural environment.	Many designs meet specific environmental needs. For example, the needs of people (e.g., food, shelter, clothing, association) are fairly constant but how they are met in a house, shopping mall, park, desert, space or under the ocean are quite different. Students must recognize these differences and design for them.
Elements and Principles	• identify and use the elements and principles of design, and processes associated with design, as they apply to projects in interior, architectural and/or environmental design.	

MODULE DES3070: LIVING ENVIRONMENT STUDIO 1 (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • present the results of an evaluation and user survey of human environmental needs with respect to specific projects in interior, architectural and/or environmental design • analyze at least two different design problems; e.g., an entrance to a building such as a museum, interpretive centre, or drop-in centre for seniors, a playground within a public park • identify each problem, write a project brief and structure a plan for resolution • select and use appropriate tools and materials as outlined in the project brief.	The interrelated aspect of the Living Environment modules and their close relationship to other design areas should be stressed. Students should be aware that at this advanced level idea development and presentation, collaborative work and directed individual study are crucial to the design process. These are also good modules for related field trips, and the development of contacts with professionals, manufacturers and suppliers. Form, materials and production processes may be considered at this stage though not necessarily resolved. See notes from 2-D Design Studio and 3-D Design Studio modules.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES3080: LIVING ENVIRONMENT STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students learn to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. They assess solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

Module Parameters: Specialized facilities or equipment depend on the approach taken to the module. Sketching, drawing and modelling tools and equipment and access to a computer.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in architectural, interior and/or environmental design.

Supporting Module: DES3070 Living Environment Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce advanced level designed solutions for problems in one or more living environment themes: architectural design, environmental design, interior design	• resolution of a teacher- and/or student-specified advanced level Living Environment project brief. *Assessment Tool* *Project Assessment: Living Environment Studio 2 (DES3080–1)* *Standard* *Performance rating of 2 for each criteria*	50
• apply elements and principles of design; e.g., space, form and ergonomics within architectural, environmental, and/or interior design	• selection and effective use of elements and principles of design in project work. *Assessment Tool* *Authorized resources for explanation and examples of elements and principle of design* *Project Assessment: Living Environment Studio 2 (DES3080–1)* *Standard* *Performance rating of 2 for each criteria*	10

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• make rational judgments with respect to aesthetic quality in architectural, environmental or interior design	• justification of judgements made during designing with respect to aesthetic quality of the designed solution, brought forth within the presentation/critique. *Assessment Tool* *Project Assessment: Living Environment Studio 2 (DES3080–1)* *Standard* *Performance rating of 2 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – how human and environmental needs have been addressed through the designed solution – the judgements made during the designing process, – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Living Environment Studio (Advanced) (DESPRE–3D)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES3080: LIVING ENVIRONMENT STUDIO 2 (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe how form and space are used in the context of architectural, environmental and interior design • research and compare the living and working spaces of two communities that differ in some way; e.g., climatically, socioeconomically, culturally • identify one example drawn from architectural, environmental or interior design (e.g., a frame construction house from Canada and a house from Japan) and compare them • describe the responsibility design has toward the human and natural environment.	Design cuts across our living environments structuring the macro living spaces (e.g., buildings, parks) and the micro living spaces (e.g., rooms, offices). We look for different things from design in each case. In macro space projects, the overall form, aesthetics, structural integrity and function are key components. In micro space projects, we must also consider ergonomic factors
Elements and Principles of Design	• identify the elements and principles of design used in the solution of each design problem and explain how their use has contributed to the aesthetics and function of the solution.	
Applied Problem Solving	• identify and resolve a design problem in the area(s) of architectural, environmental and/or interior design; e.g., a personal living space, a living space for an extreme environment, a commercial space, a park, a restaurant, a prefabricated living space with components that can be assembled on-location, a survival shelter • identify each problem, write a project brief and structure a plan for resolution • select and use appropriate tools and materials as outlined in the project brief • rationalize decisions made during designing and indicate how these decisions affected the aesthetic quality of the solution.	See notes from 2-D Design Studio and 3-D Design Studio modules.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1.	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES3090: LIVING ENVIRONMENT STUDIO 3

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop design solutions specific to architectural, environmental or interior design and learn about using and/or specifying appropriate materials and production processes.

Module Parameters: Sketching, drawing and modelling tools and equipment and access to a computer. Specialized facilities or equipment depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in architectural, interior and/or environmental design.

Supporting Module: DES3070 Living Environment Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • use appropriate materials and production processes to resolve set design problems	*Assessment of student achievement should be based on:* • selection and effective use of materials and associated processes in the resolution of a teacher-approved, student-specified advanced level Living Environment design brief. *Assessment Tool* *Authorized resources for examples of materials, and processes used to shape and join them* *Project Assessment: Living Environment Studio 3 (DES3090–1)* *Standard* *Performance rating of 2 for each criteria*	40

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MODULE DES3090: LIVING ENVIRONMENT STUDIO 3 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• **identify materials and products used in architectural, environmental, and/or interior design, and give reasons for their use based on their properties**	• demonstration of understanding of the relationship of materials and products and their use through writing and/or through discourse during the presentation/critique. *Assessment Tool* *Authorized resources for examples of materials* *Presentations/Reports: Living Environment Studio 3 (DES3090–2)*	20
• identify and/or specify production processes, and/or methods of manufacturing products common to architectural, environmental, and/or interior design	• justification of the selection/specification of materials and production processes for product manufacturing through writing and/or through discourse during the presentation/critique. *Assessment Tool* *Presentations/Reports: Living Environment Studio 3 (DES3090–2)* *Standard* *Performance rating of 2 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – his or her understanding of the relationship between materials and products and their use – his or her justification for the selection/specification of materials and production processes for product manufacturing. *Assessment Tool* *Presentations/Reports: Living Environment Studio 3 (DES3090–2)* *Standard* *Performance rating of 3 for each criteria*	20

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• identify materials, production processes and techniques commonly used in construction, fabrication and the finishing of living and working spaces • describe the nature of different materials (e.g., woods, metals) and how their use has evolved in design (e.g., structural design, furniture design) • describe how traditional materials (e.g., woods) have been replaced by other materials (e.g., plastics) in the living environment • identify and rationalize the materials and production processes used a design solution.	Designers use a variety of materials to create structures, fixtures, furnishing, etc. As new materials become available, they are evaluated for their properties, then used where and when appropriate. Often the same material is used for a variety of purposes with new uses evolving as design evolves. Students should recognize and examine how various materials are used and have been used in design. This knowledge will give them a basis for selecting appropriate materials for their own projects.

MODULE DES3090: LIVING ENVIRONMENT STUDIO 3 (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • demonstrate materials and production processes specific to a project • identify at least two different material and production scenarios specific to the same design project • identify materials and production processes that contribute to the structure and to the durability of a design • show resolution of construction concerns implicit in the requirements of form, space and ergonomics • identify each problem, write a project brief and structure a plan for resolution • select and use appropriate tools and materials as outlined in the project brief.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and 3-D Design Studio 3.	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES3100: CAD MODELLING STUDIO (COMPUTER-AIDED DESIGN)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students solve design problems, using advanced computer-aided design (CAD) methods, advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

Module Parameters: Access to a computer with a CAD software package capable of generating 3-D images, a compatible animation package and a printer and/or plotter.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES2030 CAD Applications

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • use advanced CAD commands and techniques to design working prototypes of solutions to advanced level design problems	*Assessment of student achievement should be based on:* • production of still and/or animated images based on advanced level design brief and using teacher-specified software. *Assessment Tool* *Project Assessment: CAD Modelling Studio (DES3100–1)* *Standard* *Performance rating of 2 for each criteria*	80

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – the software used – his or her justification for the selection/use of the software – the process used to achieve the product (e.g., collaboration). *Assessment Tool* *Presentations/Reports: CAD Modelling Studio (DES3100-2)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• identify, select and use appropriate CAD and related software (e.g., three-dimensional modelling software) in the context of design	Teachers may provide students with several options for computer software they may use. Also see the related learner expectations in 3-D Design Studio 1.

MODULE DES3100: CAD MODELLING STUDIO (COMPUTER-AIDED DESIGN (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (continued)	*The student should:* • create a three-dimensional model image and/or working drawings on a computer in response to a problem specified in a project brief, and print work generated.	Students should be made aware that time is an important factor in using CAD and that they should become faster and more efficient with each project.
Applied Problem Solving	• apply the personal computer and specified CAD software to resolve problems as outlined in project briefs.	Students should have had previous experience in CAD and feel confident in using the chosen software independently in this module. They should share CAD techniques, tips and hints to their advantage in the process of solving problems. By allowing sharing to take place, teachers and students will learn and improve their CAD techniques.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • maintain and update a portfolio as described in 2-D Design Studio 1. Additions from this module would include all project related material (e.g., sketches, notes, a computer disk containing images produced through CAD and three-dimensional modelling software, hard copies of these images), the design journal, and appropriate supplementary material.	As with the other CAD modules, students might produce portfolio of their work on a computer disk and support this with selected still images (printed or plotted) and/or a video tape of selected images.

MODULE DES3110: DRAFTING/DESIGN STUDIO 1

Level: Advanced

Theme: Drafting Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students concentrate on various drawing and drafting types to illustrate design concepts and solutions, including freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing.

Note: Completed drawings from this module may be used as preparatory material for subsequent drafting/design studio or technical drawing studio modules.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES2040 Drafting/Design Applications

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • use freehand and mechanical and/or computer aided drafting techniques to produce solutions for complex projects in areas such as architecture, fashion, product, furniture and/or other design applications	*Assessment of student achievement should be based on:* • production of "line" pictorial drawings within the context of a teacher- and/or student-specified advanced level assignment. *Assessment Tool* *Project Assessment: Drafting/Design Studio 1 (DES3110–1)* *Standard* *Performance rating of 2 for each criteria*	50

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MODULE DES3110: DRAFTING/DESIGN STUDIO 1 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• apply various drawing construction principles to produce pictorial drawings; e.g., isometric, perspective and axiometric	• selection and application of freehand, mechanical and computer aided techniques in the production of illustrative pictorial drawings of designed solutions. *Assessment Tool* *Project Assessment: Drafting/Design Studio 1 (DES3110–1)* *Standard* *Performance rating of 2 for each criteria*	10
• apply design detailing, and make rational judgements with respect to proportion, scale, composition, codes and standards	• accuracy and precision of drawings and of detailing and notations for drawings. *Assessment Tool* *Authorized resources for examples* *Project Assessment: Drafting/Design Studio 1 (DES3110–1)* *Standard* *Performance rating of 2 for each criteria*	20
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing styles chosen, and the student's discourse regarding: – the adequacy of the drawings for illustrating the designed solution – the judgements made during the assignment – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20

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MODULE DES3110: DRAFTING/DESIGN STUDIO 1 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: - demonstrate basic competencies.	*Assessment of student achievement should be based on:* - observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	- demonstrate competency in at least two different drawing types such as isometric and perspective to illustrate complex design concepts and solutions. Drawings are to be completed as line drawings only; i.e., no surface textures, shading, etc. - demonstrate competency in freehand drawing construction techniques; e.g., accuracy in proportion and scale using freehand perspective grids, underlay isometric grids, etc. - demonstrate competency in instrument and/or CAD techniques for construction of accurate, illustrative views of design solutions - select and use appropriate drawing instruments, materials, computer applications.	This may be drawing existing objects (e.g., calculator, house, running shoe) or design work from previously completed or current design studio modules (e.g., a furniture design, bird house, backpack, kitchen interior).
Applied Problem Solving	- resolve problems of design detailing during drawing projects, with attention to such aspects as proportion, scale, composition, codes and standards (as applicable).	

MODULE DES3110: DRAFTING/DESIGN STUDIO 1 (continued)

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	*The student should:* • see Specific Learner Expectations for 2-D Design Studio 1 • maintain and update a portfolio as described in 2-D Design Studio 1. Additions from this module would include all project-related material (e.g., sketches, notes, drawings completed by hand or with computer assistance), the design journal, and appropriate supplementary material.	Assemble a set of high quality, illustrative line drawings from each assignment or project, for inclusion in a portfolio or for further development in other modules.

MODULE DES3120: DRAFTING/DESIGN STUDIO 2

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop complex explanatory drawings from base (line) drawings, that may include exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. This is a skill-building module with the emphasis on explanatory line drawings.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES3110 Drafting/Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• use explanatory drawing techniques; e.g., exploded views, cut-away views, shadow and reflection construction, to convey and communicate complex design solutions	• production of pictorial drawings within the context of a teacher- and/or student-specified advanced level assignment. *Assessment Tool* *Project Assessment: Drafting/Design Studio 2 (DES3120–1)* *Standard* *Performance rating of 2 for each criteria*	50
• use appropriate drawing techniques to illustrate principles of assembly, such as mechanical function, usage	• selection and application of freehand, mechanical and/or computer-aided techniques in the production of illustrative pictorial drawings of designed solutions. *Assessment Tool* *Project Assessment: Drafting/Design Studio 2 (DES3120–1)* *Standard* *Performance rating of 2 for each criteria*	10

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MODULE DES3120: DRAFTING/DESIGN STUDIO 2 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• **use principles of communication through illustrative drawing and detailing; e.g., attention to the composition of exploded views, optimizing location of cut-away sections**	• communicative impact of illustrations based on the point(s) of view selected and illustrated. *Assessment Tool* *Project Assessment: Drafting/Design Studio 2 (DES3120–1)* *Standard* *Performance rating of 2 for each criteria*	20
• **select, organize and present design projects**	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing styles chosen, and the student's discourse regarding: – the adequacy of the drawings for explaining and detailing the designed solution – how principles of communication have been applied within the drawings – judgements and decisions made during drawing, why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)*	20
• **demonstrate basic competencies.**	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

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MODULE DES3120: DRAFTING/DESIGN STUDIO 2 (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• using existing drawings such as isometric or perspective views (from other modules or preselected by teacher), create a set of explanatory drawings (e.g., exploded, cut-aways, sections), which effectively communicate aspects of the design solution such as its assembly, function, use. Examples include exploded view of a hair dryer, cut-away of a running shoe, functions of spaces in a house, traffic circulation in public spaces • demonstrate competency in freehand explanatory techniques; e.g., accuracy in proportion and scale using freehand perspective grids, underlay isometric grids • demonstrate competency in instrument and/or CAD techniques for producing accurate explanatory views of design solutions • select and use appropriate drawing instruments, materials, computer applications, as required.	
Applied Problem Solving	• describe the best way to illustrate the assembly, function and/or use of a design solution through examination of the design, sketchbook exploration, peer and teacher discussion, and through examination of existing successful examples.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and Drafting/Design Studio 1.	Assemble a set of high quality explanatory drawings from each assignment or project, for inclusion in a portfolio or for further development in other modules such as Drafting/Design Studio 3.

MODULE DES3130: **DRAFTING/DESIGN STUDIO 3**

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students apply rendering techniques to line drawings (base or developed), concentrating on light, colour and various media; e.g., coloured pencils, marker pens, water colours, computer rendered. Presentation techniques are used to compose high quality illustrations to communicate design solution, such as rendered drawings, context backgrounds, collage and montage techniques, titles, text.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES3110 Drafting/Design Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• use various rendering techniques and media to create high quality visual representations of design solutions	• production of high quality rendered drawings within the context of a teacher- and/or student-specified advanced level assignment. *Assessment Tool* *Project Assessment: Drafting/Design Studio 3 (DES3130–1)* *Standard* *Performance rating of 2 for each criteria*	60
• create well-composed presentations of design solutions, using a combination of materials and methods, such as rendered drawings, photographs, text, theme boards, CAD, video	• presentation of products for public display and discourse during presentation/critique. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20

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MODULE DES3130: DRAFTING/DESIGN STUDIO 3 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing/rendering styles chosen, and the student's discourse regarding: – the adequacy of the drawings/renderings for illustrating the design – the adequacy of the presentation for displaying the drawings/renderings and communicating their message – judgements and decisions made during drawing and why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

MODULE DES3130: DRAFTING/DESIGN STUDIO 3 (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• using existing drawings such as isometric or perspective views, exploded views or cut-aways from other modules, (e.g., Drafting/Design Studio modules) or preselected by the teacher, create a set of rendered drawings using appropriate tools and materials (e.g., water colour, marker pens, CAD), which effectively communicates aspects of the design solution such as its general appearance, textures, materials, the design in context, the design under different lighting conditions. Examples include colour possibilities for a telephone design, rendered cut-away of a running shoe to show internal materials, entrance of a townhouse project, cut-away of a restaurant to show utilities • demonstrate competency in at least two rendering techniques; e.g., pencil and computer rendering • research, select and use materials, computer applications, as appropriate • compose high quality illustrations using rendered drawings, context backgrounds, photographs, collage and montage techniques, titles, text, etc., for visual presentation of design solutions. Examples include: – a well-composed board comprising a rendering of a lawn mower, partial exploded view to show internal workings, a photograph illustrating the product context, informative text and a title – an architectural illustration board comprising rendered elevations, sections and plans, text and titles – a sequence of rendered CAD images.	

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • evaluate and apply the best way of rendering a drawing of a design solution through examination of the design, sketchbook exploration, peer and teacher discussion and through examination of existing successful examples • evaluate and apply the optimum way of presenting the design solution in a two-dimensional visual format, which may include CAD modelling (but does not include three-dimensional physical models).	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and Drafting/Design Studio 1.	Maintain a sketchbook of rendering techniques, examples of various media, etc. Assemble a set of high quality illustrations in a presentation format from each assignment or project, for inclusion in a portfolio.

MODULE DES3140: TECHNICAL DRAWING STUDIO 1

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students produce sections, elevations and auxiliary drawings, and build upon their learnings from the intermediate level. Students may use previously produced sketches and multiview drawings as a basis for further work.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES2050 Technical Drawing Applications

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce detailed section, elevation and auxiliary views for fabrication, manufacturing and/or construction	• production of a set of detailed technical drawings based on an advanced level assignment and including one of each of the following: – section – elevation – auxiliary. *Assessment Tool* *Project Assessment: Technical Drawing Studio 1 (DES3140–1)* *Standard* *Performance rating of 2 for each criteria*	70
• identify and use codes, specifications and conventions as they apply in the drawings produced	• identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. *Assessment Tool* *Local, regional, provincial, national and international reference manuals for codes and standards* *Project Assessment: Technical Drawing Studio 1 (DES3140–1)* *Standard* *Performance rating of 2 for each criteria*	10

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing types, and the student's discourse regarding: – the adequacy of the drawings for illustrating the designed solution – the judgements made during the assignment, – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• demonstrate increased proficiency with skills and techniques learned at the intermediate levels • identify and use additional techniques, tools material and other resources as required in projects undertaken • produce at least one section view, one elevation and one auxiliary view within the context of the drawings being produced.	Students should select the appropriate techniques and procedures to meet the needs of the project they engage in. The teacher's role will be to help them choose wisely and to guide rather than direct their design activity.

MODULE DES3140: TECHNICAL DRAWING STUDIO 1 (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • from sketches and/or multiview drawing prepared in previous modules or provided by the teacher, identify and select appropriate additional views and produce them • accurately calculate dimensions as required • use codes, specifications and conventions as required • select and use appropriate tools and materials.	Students may work in several different contexts in this module including electrical, plumbing, process piping and manufacturing. Students may use traditional drafting equipment, CAD or other technology specified by the teacher to complete the module. Electrical or plumbing systems, process piping systems, molds for cast products, machined gear systems and manufacturing jigs can form the basis for this module. Teachers may choose to teach sections, elevations and auxiliary views through projects specific to this module and/or through longer term projects that will carry on into other modules.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and Drafting/Design Studio 1.	See notes from other Studio modules.

MODULE DES3150: TECHNICAL DRAWING STUDIO 2

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students identify and specify details of various product components with a focus on representations of developments; e.g., sheet metal flashing, clothing patterns, and on intersections; e.g., the intersection of two heating ducts.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES3140 Technical Drawing Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce surface developments and intersections for fabricating, constructing and/or manufacturing	• production of a set of detailed technical drawings based on an advanced level assignment and including one of each of the following: – surface development – intersection. *Assessment Tool* *Project Assessment: Technical Drawing Studio 2 (DES3150–1)* *Standard* *Performance rating of 2 for each criteria*	60
• produce drawings for different applications, such as heating ducting, tent manufacturing, outerwear manufacturing, and different materials; e.g., sheet metal, plastic, canvas, wool	• production of drawings to meet specific requirements. *Assessment Tool* *Project Assessment: Technical Drawing Studio 2 (DES3150–1)* *Standard* *Performance rating of 2 for each criteria*	10

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MODULE DES3150: TECHNICAL DRAWING STUDIO 2 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify and use codes, specifications and conventions as they apply in the drawings produced	• identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. *Assessment Tool* *Local, regional, provincial, national and international reference manuals for codes and standards* *Project Assessment: Technical Drawing Studio 2 (DES3150–1)* *Standard* *Performance rating of 2 for each criteria*	10
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing types, and the student's discourse regarding: – the adequacy of the drawings for illustrating the designed solution – how the specific requirements of materials and applications have been met in the drawings – judgments made during the assignment and why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

MODULE DES3150: TECHNICAL DRAWING STUDIO 2 (continued)

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• produce at least two examples of each of the following within the drawings produced: – intersections – surface developments • from sketches and/or multiview drawings prepared in previous modules or provided by the teacher, produce additional drawings appropriate to the design's requirements • accurately calculate dimensions as required • use codes, specifications and conventions as required • select and use appropriate tools and materials.	See notes from other Technical Drawing modules.
Applied Problem Solving	• produce drawings that take into account different materials and applications.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and Drafting/Design Studio 1.	See notes from other Studio modules.

MODULE DES3160: **TECHNICAL DRAWING STUDIO 3**

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students diagram and illustrate the design specifications for a product, structure and/or process as a basis for fabrication, manufacturing and/or construction. They complete a set of working drawings for a self-generated or teacher-specified designed item.

Module Parameters: Basic sketching and drawing tools and equipment, drafting tables, equipment and materials and/or a computer with a computer-aided design (CAD) software package, a printer and/or plotter.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline, drafting and CAD.

Supporting Module: DES3140 Technical Drawing Studio 1

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• produce a complete set of working drawings for a student-generated or teacher-specified designed item	• production of a complete set of detailed working drawings based on an advanced level assignment. *Assessment Tool* *Project Assessment: Technical Drawing Studio 3 (DES3160–1)* *Standard* *Performance rating of 2 for each criteria*	70
• identify and use codes, specifications and conventions as they apply in the drawings produced	• identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. *Assessment Tool* *Local, regional, provincial, national and international reference manuals for codes and standards* *Project Assessment: Technical Drawing Studio 3 (DES3160–1)* *Standard* *Performance rating of 2 for each criteria*	10

MODULE DES3160: TECHNICAL DRAWING STUDIO 3 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the technical execution and completeness of the drawing types, and the student's discourse regarding: – the intent and purpose of the drawing – how specific requirements have been met within the drawings – judgements made during the assignment and why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Drafting for Design and Technical Drawing Skills (Advanced) (DESPRE–3E)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• produce a complete set of working drawings for the fabrication, manufacture and/or construction of a designed item; e.g., a building, system, machined item, pre-fabricated component: – include all dimensioning details required for production – ensure all codes are met in the specifications indicated • select and use appropriate tools and materials as outlined in the design brief.	See notes from other Technical Drawing modules.

MODULE DES3160: TECHNICAL DRAWING STUDIO 3 (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • given a design for which working drawings are to be produced, select appropriate drawing types (e.g., sections, elevations, detail drawings, assembly drawings) to satisfy the detail needs for fabrication, manufacturing and/or construction of a designed item • rationalize the selection of materials used in the design project based on their properties.	See notes from other Technical Drawing and Drafting/Design Studio modules.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 and Drafting/Design Studio 1.	See notes from other Studio modules.

MODULE DES3170: VISUALIZING THE FUTURE

Level: Advanced

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students explore new possibilities in design, including the role of the designer and the challenges that are faced by the designers.

Module Parameters: Basic sketching, drawing and modelling tools and equipment and access to a computer for research and design discipline. Specialized equipment or facilities depend on the approach taken to the module.

Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline.

Supporting Module: DES2060 The Evolution of Design

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify a potential design challenge; e.g., a habitat for a space colony, and design a solution for it	• production of drawings and/or models and/or prototypes of a designed solution. *Assessment Tool* *Project Assessment: Visualizing the Future (DES3170–1)* *Standard* *Performance rating of 3 for each criteria*	60
• provide research supporting the design solution	• presentation of research in writing and/or through discourse during the presentation/critique. *Assessment Tool* *Presentations/Reports: Visualizing the Future (DES3170–2)* *Standard* *Performance rating of 3 for each criteria*	20

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• select, organize and present design projects	• maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the design brief, and the student's discourse regarding: – how the project brief is resolved through the designed solution – the strengths and weaknesses of the solution – the judgements made during the designing processes – why these were made – the effect they had in shaping the final result. *Assessment Tool* *Presentations/Reports: Visualizing the Future (DES3170–2)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
	The student should:	
Skills Development	• describe the role, and some of the challenges that will be faced by designers in the future • indicate how this role and these challenges will differ from those currently faced by designers.	

MODULE DES3170: VISUALIZING THE FUTURE (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • write a project brief detailing the problem to be solved and structure a plan for resolution • create a designed solution • research future design and apply it to the design problem • rationalize design decisions made based on research findings.	This module will help students consider future design possibilities. The problems identified might have to do with space or undersea exploration, medicine or genetics, high fashion or survival gear. The possibilities are endless. The important feature of this module is to provide students with the impetus to positively challenge the future and to break away from their current paradigms.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • present interim findings for teacher/peer review and input • maintain and update a portfolio as described in 2-D Design Studio 1. Additions from this module would include all project related material (e.g., a bibliography of research sources, presentation paper, design solution, videotape of presentation), the design journal, and appropriate supplementary material.	See notes from other Studio modules.

MODULE DES3180: THE DESIGN PROFESSION

Level:	Advanced
Theme:	Business/Issues/History
Prerequisite:	None
Module Description:	Students develop an understanding of the business aspect of the design profession, including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may also be explored.
Module Parameters:	No specialized facilities or equipment. **Note:** It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline and business experience.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• conduct research in one area of the business/profession of design	• demonstration of a general knowledge of the business and profession of design through project work. *Assessment Tool* *Project Assessment: The Design Profession (DES3180–1)* *Standard* *Performance rating of 3 for each criteria*	40
• identify and consider various issues faced by designers	• formal presentation to teachers and peers. *Assessment Tool* *Presentation/Reports: The Design Profession (DES3180–2)* *Standard* *Performance rating of 3 for each criteria*	40

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MODULE DES3180: THE DESIGN PROFESSION (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • select, organize and present design projects	*Assessment of student achievement should be based on:* • maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the presentation of research, and the student's discourse regarding: – his or her understanding about the business and profession of design – issues faced by designers – how he or she would deal with these issues. *Assessment Tool* *Project Assessment: The Design Profession (DES3180–1)* *Standard* *Performance rating of 3 for each criteria*	20
• demonstrate basic competencies.	• observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • identify three issues faced by designers and state how these issues might be dealt with in the context of a small design company • research the business and profession of design (use reference sources, contact people working in a design field) • describe the opportunity for a designer to practise in the immediate community and adjacent communities • identify the qualifications required of young designers to be accepted by the design community.	

MODULE DES3180: THE DESIGN PROFESSION (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • outline a plan for a small design company; e.g., identify the area of design specialty, prospective clients, production logistics, financing, promotion, etc.	This module provides an excellent opportunity for students to establish contacts in the design field of their choice. These contacts may be local, regional, provincial, national or international. Once a contact has been made, the student may be able to use this contact as a primary research source for the module. The issues faced by practitioners, their day-to-day activities and their background and training will provide the student with valuable insight into the business and profession of design. This module could be addressed by a design team. The team could conduct individual and/or joint research and then make a joint presentation of the findings.
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • present interim findings for teacher/peer review and input.	See notes from other Studio modules.

MODULE DES3190: PORTFOLIO PRESENTATION

Level: Advanced

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students prepare a presentation portfolio for a specific purpose, such as entry into the workplace or a post-secondary institution.

Module Parameters: Tools and equipment for mounting, recording and/or displaying design work. Specialized facilities or equipment depend on the approach taken to the module.
Note: It is recommended that students have access to instruction from an individual with formal, specialized training in a design discipline.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• prepare a presentation portfolio for the purpose of gaining entry into the workplace and/or a post-secondary educational institution	• quality of the portfolio. *Assessment Tool* *Project Assessment: Portfolio Presentation (DES3190–1)* *Standard* *Performance rating of 3 for each criteria*	70
• present the portfolio in an interview setting	• preparation and presentation of a design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and peers will be placed on the scope and presentation quality of the portfolio, and the student's ability to present his or her portfolio in a professional manner. *Assessment Tool* *Presentations/Reports Portfolio Presentation (DES3190–2)* *Standard* *Performance rating of 3 for each criteria*	30

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Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal exploration during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	*The student should:* • describe the purpose of the portfolio being designed.	It is extremely important for students to be able to present a well-crafted portfolio. The portfolio should exhibit the breadth and depth of the student's capabilities, and indicate his or her academic, personal management and teamwork skills. The portfolio may take several forms and be made up of several parts (e.g., flats of two-dimensional design and photography, photographs or slides of three-dimensional work, video tape, computer disk, or any combination of the above). The student's collection of work retained during his or her studies in design will form the basis for this final presentation portfolio.

MODULE DES3190: PORTFOLIO PRESENTATION (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	*The student should:* • select the most appropriate work for inclusion in the portfolio • prepare the selected work for inclusion in the portfolio. This might include remounting and/or reworking some pieces, photographing or videotaping design work • write a supporting page introducing the student and providing a listing and short description of the portfolio contents and/or provide a description of the work and rationale for the work through the video medium.	
Presentation, Design Journal and Portfolio	• see Specific Learner Expectations for 2-D Design Studio 1 • present completed portfolio to teacher and peers.	See notes from other Studio modules.

DESIGN STUDIES

SECTION G: ASSESSMENT TOOLS

The following pages comprise background information and strategies for assessing student achievement and the assessment tools that are listed in Sections D, E and F of this Guide.

This section of the Guide to Standards and Implementation has been designed to provide a common base of understanding about the level of competencies students are expected to demonstrate to successfully complete a module. The goal is to establish assessment standards for junior and senior high school students that are fair, credible and challenging.

These tools will assist teachers throughout the province to more consistently assess student achievement. The purpose of expanding on the assessment standards is to:

- increase confidence among students, parents, business/industry and post-secondary that students can demonstrate the competencies specified in the modules they have completed
- encourage fairness and equity in how students' efforts are judged
- enable learners to focus effort on key learnings
- support teachers and community partners in planning and implementing CTS.

These tools were validated during the optional stage of CTS implementation.

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ASSESSING STUDENT ACHIEVEMENT IN CTS

The CTS assessment standards assess two basic forms of competency:

- What can a student ***do***?
  - **make** a product (e.g., wood bowl, report, garment)
  - **demonstrate** a process
    - strand-related competencies (e.g., keyboarding, hair cutting, sewing techniques, lab procedures)
    - basic competencies (e.g., resource use, safety procedures, teamwork).

- What does a student ***know***?
  - knowledge base needed to demonstrate a competency (link theory and practice).

CTS Defines *Summative* Assessment Standards

The assessment standards and tools defined for the CTS modules, referenced in Sections D, E and F of this Guide, focus on the final (or summative) assessment of student achievement.

Assessment throughout the learning period (formative assessment) will continue to evaluate how students are progressing. Teachers direct and respond to students' efforts to learn—setting and marking tasks and assignments, indicating where improvement is needed, sending out interim reports, congratulating excellence, etc.

Teachers will decide which instructional and assessment strategies to apply during the formative learning period. As formative and summative assessment are closely linked, some teachers may wish to modify the tools included in this section to use during the instructional process. Teachers may also develop their own summative assessment tools as long as the standards are consistent with the minimum expectations outlined by Alberta Education.

Grading and Reporting Student Achievement

When a student can demonstrate ALL of the exit-level competencies defined for the module (module learner expectations), the teacher will designate the module as "successfully completed." The teacher will then use accepted grading practices to determine the percentage grade to be given for the module—a mark not less than 50%.

The time frame a teacher allows a student to develop the exit-level competency is a local decision. NOTE: The Senior High School Handbook specifies that students must have access to 25 hours of instruction for each credit. Students may, however, attain the required competencies in less time and may proceed to other modules.

Teachers are encouraged to consult their colleagues to ensure grading practices are as consistent as possible.

High school teachers may wish to refer to "Directions for Reporting Student Achievement in CTS" for information on how to use the CTS course codes to report the credits that students have earned to Alberta Education. (Copies of this document have been forwarded to superintendents and senior high school principals.)

Components of Assessment Standards in CTS

The following components are included in each module:

- **module learner expectations** (in the shaded left column of the module) define the exit-level competencies students are expected to achieve to complete a module. Each MLE defines and describes critical behaviours that can be measured and observed. The student must meet the standard specified for **ALL** MLEs within a module to be successful.

- **suggested emphasis** (right column of the module) provides a guideline for the relative significance of each MLE and can be used to organize for instruction.

- **criteria and conditions** (middle column of the module) set the framework for the assessment of student competency, specifying the minimum standard for performance and including a reference to assessment tools, where appropriate.

  Criteria define the behaviours that a student must demonstrate to meet the designated standard. For example, the criteria could describe the various techniques that must be demonstrated when using a tool, and/or describe the minimum components of a project the student must complete.

  Conditions outline the specifications under which a student's competency can be judged. For example, the conditions could specify whether the assessment should be timed or not, or if the student should be allowed to access to support resources or references.

  Standard may be defined by (1) assessment tools, which are referenced in this section (or sometimes in approved learning resources) and/or (2) "illustrative examples" of student work, if appropriate.

  Assessment Tools included in this section of the Guide (e.g., checklists, rubrics/rating scales) tend to be of two types:

  - tools generic to a strand or to the entire CTS program; e.g., a standard five-point Project Assessment Scale/Rubric is used in all strands. Other generic tools include assessing reports and presentations. *(Names of these tools include the strand code [e.g., "INF" for Information Processing] and a code for the type of tool [e.g., "TDENT" for Text–Data Entry].)*

  - tools specific to a module; e.g., assessment checklist for assessing a venture plan in Enterprise and Innovation or a checklist for sketching, drawing and modelling in Design Studies. *(Names of these tools include the module code; e.g., "INF1010-1" indicating that it is the first module-specific tool used in Information Processing 101.)*

Development and Validation Processes

The "Criteria and Conditions" and "Suggested Emphasis" columns have been validated with extensive input from teachers, professional associations/contacts and post-secondary institutions. The goal is to prepare well-structured assessment standards and related assessment tools that:

- establish an appropriate level of challenge and rigour
- relate directly to the type of learning described in the curriculum standard
- are easy to understand
- are efficient to implement
- can provide a consistent measure of what was expected to be measured.

As students and teachers work with the assessment standards and tools, it is expected that levels of performance will increase as more and more students are able to achieve the minimum standard. Therefore, the assessment standards and related tools will continue to be monitored, and revised as necessary to ensure appropriate levels or rigour and challenge, and successful transitions for students as they leave high school and enter the workplace or related post-secondary programs.

ASSESSING STUDENT ACHIEVEMENT IN DESIGN STUDIES

The Design Studies curriculum is based on the notion of recognizable outcomes that may be compared to stated standards. In Design Studies, the standards identify students' growth in knowledge, skills and attitudes. The curriculum defines outcomes through the module learner expectations (MLEs) and specific learner expectations (SLEs). It also suggests criteria and conditions for assessment and the emphasis to be placed on each expectation. These elements combine to provide an overall framework for instruction and assessment.

But student growth and the assessment standards that describe this growth are brought about through several components. To get a clear picture of the growth, you need to consider the increased expectations of students with respect to their ability to use a process of design or ability to produce technical drawings and renderings. You must also consider the level of maturity and intellectual and technical skill students bring to their assignments and the rigour of the projects themselves. You need to design projects that will allow student to meet the requirements of the module and are consistent with the level of the module being assigned. A projects rubric that outlines common characteristics for projects at each level has been included with this introduction for your reference. The specifics of the assignments (e.g., theme, topic, resources, tools, materials, processes, scope) are up to you.

Assessment Tools

A variety of tools have been provided for your reference and use. They are intended to help you assess students' work as accurately and consistently as possible by stating standards of performance for elements felt to be important within the curriculum as a whole or in specific modules. They also provide standards for "basic competencies" students should be able to demonstrate while engaged in learning.

Some of the tools developed for Design Studies take the form of assessment frameworks that state standards for specific themes across the levels of the curriculum. For example, an assessment framework is provided for assessing students application of a seven-part process of design. Standards statements are provided at each level for each of the seven parts. Tools have also been developed for assessing specific curricular requirements. These include assessment frameworks for assessing research activities students will engage in and a second for assessing students' presentations. They have been drawn from a pool of generic tools that have been developed for CTS and should be used in conjunction with other project assessment tools. A series of module-specific assessment tools have also been developed and are referred in the Assessment Criteria and Conditions as required.

Assessing Basic Competencies

Basic Competencies are those traits all students are expected to demonstrate no matter the level or context of their learning. An assessment guide for basic competencies, the Basic Competencies Reference Guide has been developed and is included in the assessment tools. As students progress from one stage or level to another, the expectations placed on them change and in general increase. The "basic competencies" guide reflects this change. You may use the Basic Competencies Reference Guide as part of your assessment strategy.

Assessing Project-based Work

A series of "standards statements" have been developed for all CTS strands that briefly describe student performance in five developmental stages. These statements are:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

Criteria has been identified that these statements can be measured against. In general, all Design Studies students should perform each criteria to the following standard:

Introductory level modules: Standard = 1
Intermediate level modules: Standard = 2
Advanced level modules: Standard = 3.

The required standards of performance are stated in the "Assessment Criteria and Conditions" columns in each module.

The assessment tools for Design Studies can be used to assess the project-based work you assign. Each tool specifies standards of performance for students at all levels using a rating scale of 0–4. To successfully complete a module, students are expected to meet the standard identified for the level of the module they are taking. The standard for each level has been indicated on the assessment tool and the Assessment Criteria and Conditions for each module.

Design Studies Process Assessment Framework (DESPAF)

This assessment framework is based on the notion that students will follow a process as they work through their projects and that this process has a number of logical steps. These steps have been organized sequentially; however, it is unlikely that students will follow this sequence specifically. Process work is *iterative* in that the steps tend to be revisited several times before the project is completed. Each time they are revisited, the project is brought closer to a satisfactory resolution. The completed project may an end in itself, it may provide a portion of a complete solution or it my be a springboard for a new idea or project. The Design Studies Process Assessment Framework provides a description of standards for each component of the process at each level. These standards should help you identify the level the student at as you observe their work activity and assess their projects.

Design Studies Drafting for Design and Technical Drawing Assessment Frameworks

Two assessment frameworks have been provided for the Drafting for Design and Technical Drawing modules, one for Pictorial Drawings (DESDAF–1) and one for Multiview Drawings (DESDAF–2). As with the other frameworks, these identify general standards of performance at each level. You will note that they take into account that some students will be producing their work mechanically while others will be using computer-aided design (CAD) packages. The frameworks do not specify assignments for students to complete. They are to be used in conjunction with other assessment tools.

Specific assessment tools have been designed for individual modules. While they may have some of the same criteria, they differ from each other through the content detail. Each tool provides a 0–4 rating and corresponding set of "standard statements." In most cases, students are expected to complete all elements of each criteria; however, in some instances (e.g., teamwork) the criteria is not possible and would be indicated as Not Applicable (N/A).

Marks and Mark Ranges

You will note that no marks or mark ranges have been assigned on any of the assessment tools. This is because you are in the best position to determine the marks students should receive for the work they produce. If a student meets the standards as stated in the assessment tools, they should receive credit for the module. It may however be that one student's work is "better" than another students because of its scope, technical quality or aesthetic quality. Or it may be that one student is more proficient than another due to their perseverance, responsibility level or technical skill. You can recognize this through your marks even though both students will have met the standard for the module.

BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each module. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework*. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages**. Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Managing Learning			
☐ comes to class prepared for learning	☐ ——▶——▶	☐ ——▶——▶	☐ ——▶——▶
☐ follows basic instructions, as directed	☐ follows instructions, with limited direction	☐ follows detailed instructions on an independent basis	☐ ——▶——▶
	☐ sets goals and establishes steps to achieve them, with direction	☐ sets clear goals and establishes steps to achieve them	☐ demonstrates self-direction in learning, goal setting and goal achievement
☐ acquires specialized knowledge, skills and attitudes	☐ applies specialized knowledge, skills and attitudes in practical situations	☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations	☐ transfers and applies learning in new situations; demonstrates commitment to lifelong learning
☐ identifies criteria for evaluating choices and making decisions	☐ identifies and applies a range of effective strategies for solving problems and making decisions	☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions	☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions
☐ uses a variety of learning strategies	☐ explores and uses a variety of learning strategies, with limited direction	☐ selects and uses effective learning strategies	☐ ——▶——▶
		☐ cooperates with others in the effective use of learning strategies	☐ provides leadership in the effective use of learning strategies
Managing Resources			
☐ adheres to established timelines; uses time/schedules/planners effectively	☐ creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis
☐ uses information (material and human resources), as directed	☐ accesses and uses a range of relevant information (material and human resources), with limited direction	☐ accesses a range of information (material and human resources), and recognizes when additional resources are required	☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement
☐ uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service	☐ uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision	☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis	☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies)
☐ maintains, stores and/or disposes of equipment and materials, as directed	☐ maintains, stores and/or disposes of equipment and materials, with limited assistance	☐ maintains, stores and/or disposes of equipment and materials on an independent basis	☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation			
☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches	☐ identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints	☐ thinks critically and acts logically in the context of problem solving	☐ identifies and resolves problems efficiently and effectively
☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ applies problem-solving skills to a directed or a self-directed activity, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ transfers problem-solving skills to real-life situations, by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks	☐ identifies and suggests new ideas to get the job done creatively, by: – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— *The student:*	**Stage 2—** *The student:*	**Stage 3—** *The student:*	**Stage 4—** *The student:*
Communicating Effectively ☐ uses communication skills; e.g., reading, writing, illustrating, speaking	☐ communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means	☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments	☐ negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests
☐ uses language in appropriate context	☐ uses technical language appropriately	☐ encourages, persuades, convinces or otherwise motivates individuals	☐ negotiates and works toward a consensus
☐ listens to understand and learn	☐ listens and responds to understand and learn	☐ listens and responds to understand, learn and teach	☐ listens and responds to understand, learn, teach and evaluate
☐ demonstrates positive interpersonal skills in selected contexts	☐ demonstrates positive interpersonal skills in many contexts	☐ demonstrates positive interpersonal skills in most contexts	☐ promotes positive interpersonal skills among others
Working with Others ☐ fulfills responsibility in a group project	☐ →	☐ seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload	☐ leads, where appropriate, mobilizing the group for high performance
☐ works collaboratively in structured situations with peer members	☐ cooperates to achieve group results	☐ works in a team or group: – encourages and supports team members – helps others in a positive manner – provides leadership/ followership as required – negotiates and works toward consensus as required	☐ understands and works within the context of the group
☐ acknowledges the opinions and contributions of others in the group	☐ maintains a balance between speaking, listening and responding in group discussions ☐ respects the feelings and views of others		☐ prepares, validates and implements plans that reveal new possibilities
Demonstrating Responsibility **Attendance** ☐ demonstrates responsibility in attendance, punctuality and task completion	☐ →	☐ →	☐ →
Safety ☐ follows personal and environmental health and safety procedures	☐ recognizes and follows personal and environmental health and safety procedures	☐ establishes and follows personal and environmental health and safety procedures	☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations
☐ identifies immediate hazards and their impact on self, others and the environment	☐ identifies immediate and potential hazards and their impact on self, others and the environment	☐ →	☐ →
☐ follows appropriate/emergency response procedures	☐ →	☐ →	☐ →
			☐ demonstrates accountability for actions taken to address immediate and potential hazards
Ethics ☐ makes personal judgements about whether or not certain behaviours/actions are right or wrong	☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school	☐ assesses the implications of personal/group actions within the broader community; e.g., workplace	☐ analyzes the implications of personal/group actions within the global context
			☐ states and defends a personal code of ethics as required

*** Developmental Framework** • *Simple task* • *Structured environment* • *Directed learning*	• *Task with limited variables* • *Less structured environment* • *Limited direction*	• *Task with multiple variables* • *Flexible environment* • *Self-directed learning, seeking assistance as required*	• *Complex task* • *Open environment* • *Self-directed/self-motivated*

GENERIC RATING SCALE

SCALE	**RUBRIC STATEMENT** **(included in assessment tool/statements in *italics* are optional)** ***The student:***	**IS TASK/ PROJECT COMPLETED?**	**PROBLEM SOLVING:** **STUDENT INITIATIVE VS TEACHER DIRECTION/ SUPPORT**	**USE OF TOOLS, MATERIALS, PROCESSES**	***STANDARDS OF QUALITY/ PRODUCTIVITY***	***TEAMWORK LEADERSHIP***	***SERVICE CLIENT/ CUSTOMER***
4	exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. *Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.*	Exceeds defined outcomes.	Plans and solves problems effectively and creatively in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	*Quality, particularly details and finishes, and productivity are consistent and exceed standards.*	*Leads others to contribute team goals.*	*Analyzes and provides effective client/customer services beyond expectations.*
3	meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. *Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.*	Meets defined outcomes.	Plans and solves problems in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently and effectively.	*Quality and productivity are consistent.*	*Works cooperatively and contributes ideas and suggestions that enhance team effort.*	*Analyzes and provides effective client/customer services.*
2	meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.*	Meets defined outcomes.	Plans and solves problems with limited assistance.	Tools, materials and/or processes are selected and used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively to achieve team goals.*	*Identifies and provides customer/client services.*
1	meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.*	Meets defined outcomes.	Follows a guided plan of action.	A limited range of tools, materials and/or processes are used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively.*	*Provides a limited range of customer/client services.*
0	has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.	Has not completed defined outcomes.		Tools, materials and/or processes are used inappropriately.			

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ASSESSMENT FRAMEWORK: ISSUE ANALYSIS

CTSISS

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning • accurately describes an issue on which people disagree • poses an important question regarding the issue • accesses basic in-school/community information sources regarding the issue • uses one or more information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining areas of disagreement • poses one or more thoughtful questions regarding the issue • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining specific causes of disagreement • poses thoughtful questions regarding the issue • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data
Analyzing Perspectives • clarifies different points of view regarding the issue; *e.g., social, economic, environmental* • states a position on the issue and logical reasons for adopting that position • states an opposing position on the issue and logical reasons for adopting that position • identifies sources of conflict among different positions • distinguishes between fact and fiction/opinion/theory	**Analyzing Perspectives** • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related* • states a position on the issue and logical reasons for adopting that position • states two or more opposing positions on the issue and logical reasons for adopting each position • describes interrelationships among different perspectives/points of view • determines accuracy/currency/reliability of information and ideas	**Analyzing Perspectives** • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related, scientific, political* • states a position on the issue and insightful reasons for adopting that position • states three or more opposing positions on the issue and thoughtful reasons for adopting each position • analyzes interrelationships among different perspectives/points of view • recognizes underlying bias/assumptions/values in information and ideas
Collaboration and Teamwork • shares work appropriately among group members • respects the views of others	**Collaboration and Teamwork** • shares work appropriately among group members • respects and considers the views of others • negotiates solutions to problems	**Collaboration and Teamwork** • shares work appropriately among group members • respects and considers the views of others • negotiates with sensitivity solutions to problems
Evaluating Choices/Making Decisions • identifies useful alternatives regarding the issue • establishes criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate alternative based on established criteria • reflects on strengths/weaknesses of decisions by considering consequences • communicates information in a logical sequence to justify choices/decisions made	**Evaluating Choices/Making Decisions** • identifies important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences • communicates ideas in a logical sequence with supporting detail to justify choices/decisions made	**Evaluating Choices/Making Decisions** • describes in detail important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate and useful alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences and implications • communicates thoughts/feelings/ideas clearly to justify choices/decisions made

ASSESSMENT FRAMEWORK: LAB INVESTIGATIONS

CTSLAB

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Management • prepares self for task • organizes and works in an orderly manner • carries out instructions accurately • uses time effectively	**Management** • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively • adheres to routine procedures	**Management** • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively in a logical sequence • displays leadership in adhering to routine procedures • attempts to solve problems prior to requesting help
Teamwork • cooperates with group members • shares work appropriately among group members	**Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems	**Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication skills
Use of Equipment and Materials • selects and uses appropriate equipment/materials • follows safe procedures/techniques • weighs and measures accurately • returns clean equipment/materials to storage areas	**Use of Equipment and Materials** • selects and uses appropriate equipment/materials • models safe procedures/techniques • weighs and measures accurately • practises proper sanitation procedures • minimizes waste of materials • advises of potential hazards and necessary repairs	**Use of Equipment and Materials** • selects and uses equipment/materials independently • demonstrates concern for safe procedures/techniques • weighs and measures accurately and efficiently • practises proper sanitation procedures • minimizes waste of materials • anticipates potential hazards and emergency response
Investigative Techniques • gathers and applies information from at least one source • makes predictions that can be tested • sets up and conducts experiments to test a prediction • distinguishes between manipulated/responding variables • obtains results that can be used to determine if some aspect of the prediction is accurate • summarizes important experimental outcomes	**Investigative Techniques** • gathers and applies information from a variety of sources • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • identifies and explains manipulated/responding variables • obtains accurate results that confirm/reject the prediction • summarizes and applies experimental outcomes	**Investigative Techniques** • uses relevant information to explain observations • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • analyzes relationships among manipulated/responding variables • obtains accurate results that confirm/reject prediction and answer related questions • summarizes, applies and evaluates experimental outcomes

ASSESSMENT FRAMEWORK: NEGOTIATION AND DEBATE

CTSNEG

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning • accurately describes an issue on which people disagree • poses an important question regarding the issue • accesses basic in-school/community information sources regarding the issue • uses one or more information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining areas of disagreement • poses one or more thoughtful questions regarding the issue • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining specific causes of disagreement • poses thoughtful questions regarding the issue • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data
Analyzing Perspectives • states a position on the issue and logical reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences • clarifies different points of view regarding the issue; *e.g., social, economic, environmental* • distinguishes between fact and fiction/opinion/theory	**Analyzing Perspectives** • states a position on the issue and logical reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related* • determines accuracy/currency/reliability of information and ideas	**Analyzing Perspectives** • states a position on the issue and insightful reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences and implications • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related, scientific, political* • recognizes underlying bias/assumptions/values in information and ideas
Collaboration and Teamwork • works with a range of peer members • shares information/opinions/suggestions through group discussion • listens to and respects the views of others	**Collaboration and Teamwork** • works with a range of peer members • shares information/opinions/suggestions, maintaining a balance between speaking and listening • listens to and respects the views of others, requesting clarification as necessary from other group members	**Collaboration and Teamwork** • works with a wide range of peer members • shares information/opinions/suggestions, maintaining a balance between speaking and listening • listens to and respects the views of others, requesting clarification as necessary from other group members
Negotiating and Debating • presents a convincing argument in logical sequence supporting a position adopted on the issue • provides a relevant response to opposing arguments • speaks clearly so the argument can be understood • establishes a shared understanding of key alternatives and consequences relevant to the issue	**Negotiating and Debating** • presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance • provides a relevant and convincing response to opposing arguments • speaks clearly without hesitation so the argument can be understood • negotiates a shared agreement on preferred alternatives relevant to the issue	**Negotiating and Debating** • presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance and backing each with sound evidence • provides a relevant and convincing rebuttal to opposing arguments • speaks clearly without hesitation so the argument can be understood by all listeners • negotiates a shared agreement on preferred alternatives by resolving divergent points of view

ASSESSMENT FRAMEWORK: PRESENTATIONS/REPORTS

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning	**Preparation and Planning**	**Preparation and Planning**
• sets goals and follows instructions accurately	• sets goals and describes steps to achieve them	• sets goals and describes steps to achieve them
• responds to directed questions and follows necessary steps to find answers	• uses personal initiative to formulate questions and find answers	• uses personal initiative to formulate questions and find answers
• accesses basic in-school/community information sources	• accesses a range of relevant in-school/community resources	• accesses a range of relevant information sources and recognizes when additional information is required
• interprets and organizes information into a logical sequence	• interprets, organizes and combines information into a logical sequence	• interprets, organizes and combines information in creative and thoughtful ways
• records information accurately, using correct technical terms	• records information accurately with appropriate supporting detail and using correct technical terms	• records information accurately, using appropriate technical terms and supporting detail
• uses time effectively	• plans and uses time effectively	• plans and uses time effectively, prioritizing tasks on a consistent basis
	• gathers and responds to feedback regarding approach to task and project status	• assesses and refines approach to task and project status based on feedback and reflection
Presentation	**Presentation**	**Presentation**
• demonstrates effective use of at least one medium of communication:	• demonstrates effective use of at least two communication media:	• demonstrates effective use of a variety of communication media:
e.g., Written: *spelling, punctuation, grammar, basic format*	*e.g., Written:* *spelling, punctuation, grammar, format (formal/informal)*	*e.g., Written:* *spelling, punctuation, grammar, format (formal/informal, technical/literary)*
Oral: *voice projection, body language*	*Oral:* *voice projection, body language, appearance*	*Oral:* *voice projection, body language, appearance, enthusiasm, evidence of prior practice*
Audio-visual: *techniques, tools*	*Audio-visual:* *techniques, tools, clarity*	*Audio-visual:* *techniques, tools, clarity, speed and pacing*
• uses correct grammatical convention and technical terms through proofreading/editing	• maintains acceptable grammatical and technical standards through proofreading and editing	• maintains acceptable grammatical and technical standards through proofreading and editing
• provides an introduction that describes the purpose of the project	• provides an introduction that describes the purpose and scope of the project	• provides an introduction that describes the purpose and scope of the project
• communicates information in a logical sequence	• communicates ideas into a logical sequence with sufficient supporting detail	• communicates thoughts/feelings/ideas clearly to justify or challenge a position
• states a conclusion based on a summary of facts	• states a conclusion by synthesizing the information gathered	• states a conclusion by analyzing and synthesizing the information gathered
• provides a reference list of three or more basic information sources	• provides a reference list that includes five or more relevant information sources	• gives evidence of adequate research through a reference list including seven or more relevant information sources

ASSESSMENT FRAMEWORK: RESEARCH PROCESS

CTSRES

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning • sets goals and follows instructions accurately • adheres to established timelines • responds to directed questions and follows necessary steps to find answers • uses time effectively	**Preparation and Planning** • sets goals and establishes steps to achieve them • creates and adheres to useful timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively	**Preparation and Planning** • sets clear goals and establishes steps to achieve them • creates and adheres to detailed timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively, prioritizing tasks on a consistent basis
Information Gathering and Processing • accesses basic in-school/community information sources • uses one or more information-gathering techniques • interprets and organizes information in a logical sequence • records information accurately, using correct technical terms • distinguishes between fact and fiction/opinion/theory • responds to feedback when current approach is not working	**Information Gathering and Processing** • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques • interprets, organizes and combines information into a logical sequence • records information accurately with appropriate supporting detail and using correct technical terms • determines accuracy/currency/reliability of information sources • gathers and responds to feedback regarding approach to the task	**Information Gathering and Processing** • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data • interprets, organizes and combines information in creative and thoughtful ways • records information accurately with appropriate supporting detail and using correct technical terms • recognizes underlying bias/assumptions/values in information sources • assesses and refines approach to the task and project status based on feedback and reflection
Collaboration and Teamwork • cooperates with group members • shares work appropriately among group members	**Collaboration and Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems	**Collaboration and Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication and leadership skills
Information Sharing • demonstrates effective use of one or more communication media; *e.g., written, oral, audio-visual* • communicates information in a logical sequence • uses correct grammatical convention and technical terms • cites three or more basic information sources	**Information Sharing** • demonstrates effective use of two or more communication media; *e.g., written, oral, audio-visual* • communicates ideas in a logical sequence with sufficient supporting detail • maintains acceptable grammatical and technical standards • cites five or more relevant information sources	**Information Sharing** • demonstrates effective use of a variety of communication media; *e.g., written, oral, audio-visual* • communicates thoughts/feelings/ideas clearly to justify or challenge a position • maintains acceptable grammatical and technical standards • gives evidence of adequate information gathering by citing seven or more relevant information sources

DESIGN STUDIES DRAFTING FOR DESIGN AND TECHNICAL DRAWING ASSESSMENT FRAMEWORK

DESDAF-1

Students engaged in Drafting for Design and/or Technical Drawing modules will meet these standards in their project work:

Pictorial Drawings	**Introductory Level**	**Intermediate Level**	**Advanced Level**
Freehand Pictorial Drawings and Renderings	• discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) • produces recognizable pictorial line drawings of specified subjects with guidance • uses drawing grids and other freehand drawing tools with guidance	• discriminates between different pictorial drawing and rendering techniques and styles • describes appropriate applications for different pictorial drawing and rendering techniques and styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with guidance • uses drawing grids and other freehand drawing tools with minimal guidance	• selects and uses appropriate pictorial drawing and rendering techniques and styles • selects and uses appropriate materials, tools and techniques for different rendering styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with minimal guidance • selects and uses drawing grids and other freehand drawing tools with minimal guidance
Mechanically Produced Pictorial Drawings and Renderings	• discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) • produces recognizable pictorial line drawings of specified subjects with guidance • uses manual technical drawing tools (e.g., T-square, set-square, parallel rule, drafting machine) with guidance	• discriminates between different pictorial drawing and rendering techniques and styles • describes appropriate applications for different pictorial drawing and rendering techniques and styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with guidance • uses manual technical drawing tools (e.g., T-square, set-square, parallel rule, drafting machine) with minimal guidance	• selects and uses appropriate pictorial drawing and rendering techniques and styles • selects and uses appropriate materials, tools and techniques for different pictorial and rendering styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with minimal guidance • selects and uses manual technical drawing tools (e.g., T-square, set-square, parallel rule, drafting machine) with minimal guidance
CAD Produced Pictorial Drawings and Renderings	• discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) • produces recognizable pictorial drawings of specified subjects with guidance • uses personal computer and CAD software with specific guidance	• discriminates between different pictorial drawing and rendering techniques and styles • describes appropriate applications for different pictorial drawing and rendering techniques and styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with guidance • uses personal computer and CAD software with guidance	• selects and uses appropriate pictorial drawing and rendering techniques and styles • selects and uses appropriate CAD, tools and techniques for different pictorial drawing and rendering styles • renders pictorial line drawings using tone, texture and/or colour rendering techniques with minimal guidance • selects and uses appropriate CAD applications for different rendering techniques and styles

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DESIGN STUDIES DRAFTING FOR DESIGN AND TECHNICAL DRAWING ASSESSMENT FRAMEWORK DESDAF-2

Students engaged in Drafting for Design and/or Technical Drawing modules will meet these standards in their project work:

Multiview Drawings	**Introductory Level**	**Intermediate Level**	**Advanced Level**
Mechanically Produced Multiview Drawings	• produces accurate single view and multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block • accurately dimensions single view and multiview drawings • discriminates between first angle and third angle projections • uses manual technical drawing tools (e.g., T-square, set-square) with guidance	• discriminates between different multiview drawing styles • produces accurate multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurately dimensions and notations for a multiview drawing in accordance with standards and conventions • identifies codes and specifications pertaining to project work • uses manual technical drawing tools (e.g., T-square, set-square, parallel rule, drafting machine) with guidance • describes appropriate applications of different multiview drawing styles	• produces accurate multiview drawings of complex three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurate dimensions and notations for multiview drawings as required in accordance with standards and conventions • identifies and applies codes and specifications project work • uses manual technical drawing tools (e.g., T-square, set-square, parallel rule, drafting machine) with minimal guidance • chooses appropriate drawing styles for projects
CAD Produced Multiview Drawings	• produces accurate single view and multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block • accurately dimensions single view and multiview drawings • discriminates between first angle and third angle projections • uses software with guidance	• discriminates between different multiview drawing styles • produces accurate multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurately dimensions and notations for a multiview drawing in accordance with standards and conventions • identifies codes and specifications pertaining to project work • uses a personal computer and CAD software with assistance	• produces accurate multiview drawings of complex three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurate dimensions and notations for multiview drawings as required in accordance with standards and conventions • identifies and applies codes and specifications to project work • uses a personal computer and CAD software with minimal guidance • chooses appropriate drawing styles for projects

DESIGN STUDIES PROCESS STANDARDS ASSESSMENT FRAMEWORK

DESPAF–1

Students following a *process of design* will meet these standards in their project work:

Process Components	Introductory Level	Intermediate Level	Advanced Level
Identify Need or Problem through Design Brief	• reads and accurately interprets an introductory level design brief	• reads and accurately interprets an intermediate level design brief involving a more complex set of possibilities	• accurately identifies design problem or issues and writes a project statement with project objectives and deliverables
Conduct Research	• conducts research from sources provided or identified by the teacher	• identifies pertinent research sources with guidance and conducts research pertaining to the project brief	• identifies pertinent research sources in school and community (e.g., interview with manufacturers, user groups) and conducts research pertaining to the project brief
Generate Ideas	• generates a number of innovative ideas with teacher guidance which address a simple design problem	• generates a number of innovative ideas, with a moderate level of teacher guidance, which address a more complex design problem	• generates a number of innovative ideas, with minimal teacher guidance, which address a complex design problem • demonstrates challenge of assumptions, conventions and conventional boundaries
Select Most Promising Idea	• selects most promising idea for resolving the project brief with guidance • demonstrates aesthetic awareness through selection	• selects most promising idea for resolving the design brief and provides reasons for selection • demonstrates increased aesthetic awareness by providing a reasoned rationale for selection	• selects most promising idea for resolving the design brief and supports selection with reasoned arguments • demonstrates increased aesthetic awareness through reasoned arguments supported by theory and research
Make or Model Design	• makes project with direct guidance • makes appropriate decisions about materials, tools and their applications with direct guidance	• makes project with minimal guidance • makes appropriate decisions about materials, tools and their application with minimal guidance	• makes project with guidance as requested • makes appropriate decisions about materials, tools and their applications with guidance as requested
Present Design to Others	• presents project to teacher in a portfolio in a neat and appropriate manner	• presents project to teacher in a portfolio in a neat and appropriate manner • presents work to teacher and peers for critique	• presents project to teacher in a portfolio in a neat and appropriate manner • presents and discusses work with teacher, peers and/or others in critique • suggests revisions to improve solution
Evaluate Design	• with guidance, evaluate project as to its success in satisfying the project brief and suggests why it was successful or unsuccessful	• evaluates project as to its success in satisfying the project brief • identifies why it was successful or unsuccessful • with guidance, suggests and supports revisions to improve solution	• evaluates project as to its success in satisfying the project brief • analyzes why it was successful or unsuccessful • suggests revisions to improve solution

PROJECT ASSESSMENT: TECHNIQUES, TOOLS, MATERIALS AND APPLICATIONS CHECKLIST

DESPRJ–1A

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

The following is a partial list of the techniques and materials students might use in their design work. Teachers may select techniques and materials relevant to stated module criteria and conditions appropriate to the needs of their students

	Type	**Styles/Techniques**	**Tools/Materials**		**Subject Matter**
Sketching and Drawing	*Drawing/Sketching Type* ☐ thumbnail ☐ observational ☐ planning ☐ detail ☐ other __________ __________	*Drawing/Sketching Style* ☐ line ☐ gesture ☐ scribble ☐ tonal ☐ hatching ☐ other __________ __________	*Tools* ☐ pencil ☐ colour pencil ☐ marker ☐ pen ☐ brush ☐ computer ☐ other __________ __________	*Materials* ☐ drawing paper ☐ cardboard ☐ paint ☐ ink ☐ software ☐ other __________ __________	*Human/Natural Forms* ☐ body elements (e.g., head, hand) ☐ full human form ☐ animal forms ☐ plant forms ☐ geological forms ☐ other __________ __________
Modelling	*Modelling Type* ☐ thumbnail ☐ observational ☐ detail ☐ other __________ __________	*Modelling Technique* ☐ molding or shaping ☐ adding to or removing ☐ measuring ☐ cutting ☐ joining/fastening ☐ other __________ __________	*Tools* ☐ knife ☐ foam cutter ☐ scissors ☐ screwdriver ☐ hammer ☐ saw ☐ tools for modeling clay ☐ other __________ __________	*Materials* ☐ tape ☐ wire ☐ cloth ☐ metal ☐ cardboard ☐ modelling clay ☐ foam ☐ glue ☐ plaster ☐ plastic ☐ other __________ __________	*Manufactured Materials/ Forms/Mechanisms* ☐ ceramic ☐ glass ☐ metal ☐ paper ☐ plastic ☐ wood ☐ personal articles/clothing ☐ machines ☐ structures ☐ products/packaging ☐ other __________ __________

Standard Achieved: ______

Process Related Standard

0	has difficulty following a guided course of action; requires constant direction and supervision	**1**	follows guided course of action; works independently or with others with direct supervision	**2**	follows semi-guided course of action; works independently or with others with limited direct supervision	**3**	sets own course of action with limited teacher supervision; works independently or with others without direct supervision	**4**	sets and follows course of action without assistance; works independently or with others without supervision; supports and assists the work of others

Acceptable Standard

Unless otherwise stated in the Criteria and Conditions for Assessment of the module being assessed, the Process Related Standard will be:

Introductory Level = 1 Intermediate Level = 2 Advanced Level = 3

PROJECT ASSESSMENT: DESIGN SKILLS, PROCESSES AND APPLICATIONS (Introductory)

DESPRJ-1B

Student: ______________________

Module: ______________________

Teacher: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	1
Teamwork	4 3 2 1 0 N/A	1
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	1

STANDARD IS 1 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ carries out instructions accurately
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ exhibits basic teamwork skills (e.g., cooperation, appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies and lists components of a design process
- ☐ reads a design brief and identifies:
  - ☐ task/problem to be resolved
  - ☐ constraints associated with the task/problem
  - ☐ other pertinent information
- ☐ recognizes and identifies elements and principles of design as they apply to composition and form
- ☐ uses elements and principles of design in design work
- ☐ applies identified design process when resolving design brief

Equipment and Materials
- ☐ selects and use appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ returns clean equipment/materials to storage area

COMMENTS

PROJECT ASSESSMENT: DESIGN SKILLS, PROCESSES AND APPLICATIONS (Intermediate)

DESPRJ–2A

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING						STANDARD
Management	4	3	2	1	0		2
Teamwork	4	3	2	1	0	N/A	2
Content	4	3	2	1	0		1
Equipment and Materials	4	3	2	1	0		2

STANDARD IS 2 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively
- ☐ adheres to routine procedures
- ☐ accesses a range of in-school/community resources

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ writes a design brief or structures a plan for resolving a brief
- ☐ follows a design process when resolving design brief
- ☐ selects and uses elements and principles of design in project
- ☐ selects and uses appropriate techniques to produce a designed solution
- ☐ increases proficiency with skills and techniques learned at the introductory level
- ☐ recognizes and identifies mathematical and scientific principles as they apply in the context of design work

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ models safe procedures/techniques
- ☐ minimizes waste of materials
- ☐ advises of potential hazards and necessary repairs

COMMENTS

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PROJECT ASSESSMENT: FORM, COMPOSITION AND AESTHETICS

DESPRJ-3A

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING						STANDARD
Management	4	3	2	1	0		3
Teamwork	4	3	2	1	0	N/A	3
Content	4	3	2	1	0		2
Equipment and Materials	4	3	2	1	0		3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ writes a design brief to address a specific design problem
- ☐ structures a plan for resolving the brief and follows a design process when resolving design brief
- ☐ selects and uses elements and principles of design in project and describes how their use has contributed to the aesthetics and function of the solution
- ☐ rationalizes decisions made during designing and indicates how these decisions affected the aesthetic quality of the solution
- ☐ identifies, selects and uses appropriate techniques to produce a designed solution
- ☐ increases proficiency with skills and techniques learned at the introductory and intermediate levels

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: COMMUNICATION AND HUMAN FACTORS

DESPRJ–3B

Student: ______________________

Module: ______________________

Teacher: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management

☐ prepares self for task
☐ organizes and works in an orderly manner
☐ interprets and carries out instructions accurately
☐ plans and uses time effectively in a logical sequence
☐ displays leadership in adhering to routine procedures
☐ attempts to solve problems prior to requesting help

Teamwork

☐ cooperates with group members
☐ shares work appropriately among group members
☐ negotiates with sensitivity solutions to problems
☐ displays effective communication skills
☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

☐ collects samples of commercially "designed" communication or products and make judgements as to their effectiveness
☐ describes the impact of commercially produced two- or three-dimensional designs on himself or herself
☐ describes three ways human factors can affect two- or three-dimensional design

Content (continued)

☐ writes a design brief to address a specific design problem
☐ structures a plan for resolving the brief and follows a design process when resolving design brief
☐ selects and uses elements and principles of design in project and describes how their use has contributed to the aesthetics and function of the solution
☐ rationalizes decisions made during designing and indicates how these decisions affected the aesthetic quality of the solution
☐ identifies, selects and uses appropriate techniques to produce a designed solution
☐ increases proficiency with skills and techniques learned at the introductory and intermediate levels

Equipment and Materials

☐ independently select and use equipment/materials
☐ demonstrates concern for safe procedures/techniques
☐ weighs and measures accurately and efficiently
☐ minimizes waste of materials
☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: MATERIALS AND PRODUCTION PROCESSES

DESPRJ-3C

Student: ______________________

Module: ______________________

Teacher: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies various roles in a production team and performs necessary roles
- ☐ identifies various production processes available for reproducing two-dimensional or three-dimensional design work

Content (continued)
- ☐ selects an appropriate production method for reproducing two-dimensional or three-dimensional design work
- ☐ prepares a written submission describing this process, indicating key elements of the process and how it can be managed during production
- ☐ writes a design brief to address a specific design production problem(s)
- ☐ structures a plan for resolving the brief and follows a design process when resolving design brief
- ☐ rationalizes the selection of materials based on their physical properties
- ☐ identifies, selects and uses appropriate techniques to produce a designed solution
- ☐ produces multiple copies of a two-dimensional or three-dimensional design using the selected process

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

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PRESENTATIONS/REPORTS: DESIGN SKILLS, PROCESSES AND APPLICATIONS (Introductory) DESPRE–1A

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING						STANDARD
Preparation and Planning	4	3	2	1	0		1
Teamwork	4	3	2	1	0	N/A	1
Content	4	3	2	1	0		1
Presenting/ Reporting	4	3	2	1	0		1

STANDARD IS 1 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

☐ follows instructions accurately
☐ responds to directed questions
☐ interprets and organizes information into a logical sequence
☐ uses time effectively

Teamwork

☐ cooperates with group members
☐ shares work appropriately among group members
☐ exhibits basic teamwork skills (e.g., cooperation, appropriate conduct, leadership, commitment, negotiation, sharing)

Content

☐ discusses project work (e.g., sketches, drawings and models) with their teacher describing project work, the materials, tools, processes and techniques used and providing reasons for their selection and use (as requested)

Content (continued)

☐ discusses project work (e.g., sketches, drawings and models) with a peer and/or another person
☐ uses design journal to make notes, collect ideas and represent these ideas through sketches and/or drawings as required
☐ provides design journal to teacher as required
☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

☐ provides an introduction that describes the purpose of the project
☐ uses correct grammatical convention and technical terms
☐ communicates information a logical sequence
☐ responds to questions effectively and in a courteous manner

COMMENTS

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PRESENTATIONS/REPORTS: DRAFTING FOR DESIGN AND TECHNICAL DRAWING SKILLS (Introductory) DESPRE–1B

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	1
Teamwork	4 3 2 1 0 N/A	1
Content	4 3 2 1 0	1
Presenting/ Reporting	4 3 2 1 0	1

STANDARD IS 1 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ follows instructions accurately
- ☐ responds to directed questions
- ☐ interprets and organizes information into a logical sequence
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ exhibits basic teamwork skills (e.g., cooperation, appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ discusses project work (e.g., drafting exercises, pictorial and multiview drawings) with the teacher describing:
  - ☐ project work including accurate identification of types of drawings and drawing components
  - ☐ tools used (e.g., parallel rule, computer, plotter, CAD software)
  - ☐ techniques used
  - ☐ functions used (CAD)

Content (continued)
- ☐ provides reasons for the selection and use (as requested)
- ☐ discusses project work (e.g., sketches, drawings and models) with a peer and/or another person
- ☐ uses design journal to make notes, collect ideas and represent these ideas through sketches and/or drawings as required
- ☐ provides design journal to teacher as required
- ☐ selects drawings and includes them in a design portfolio

Presenting/Reporting
- ☐ provides an introduction that describes the purpose of the project
- ☐ uses correct grammatical convention and technical terms
- ☐ communicates information a logical sequence
- ☐ responds to questions effectively and in a courteous manner

COMMENTS

PRESENTATIONS/REPORTS: DESIGN SKILLS, PROCESSES AND APPLICATIONS (Intermediate)

DESPRE–2A

Student: ______________________
Teacher: ______________________
Module: ______________________
Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	2
Presenting/ Reporting	4 3 2 1 0	2

STANDARD IS 2 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ sets goals for presentation
- ☐ interprets, organizes and combines information into a logical sequence for presentation
- ☐ gathers and responds to feedback regarding approach to task and project status
- ☐ plans and uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of solution
  - ☐ elements and principles of design used in project
  - ☐ aesthetic quality of project solution
  - ☐ materials, tools, processes and techniques used during project and providing reasons for their selection and use
  - ☐ decisions made during project and reasons for decisions made

Content (continued)
- ☐ collects ideas and represents these ideas in their design journal/sketchbook through sketches and/or drawing and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting
- ☐ demonstrates effective use of at least two communication media (e.g., voice, visual)
- ☐ maintains acceptable grammatical and technical standards
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates ideas into a logical sequence with sufficient supporting detail
- ☐ responds to questions effectively and in a courteous manner

PRESENTATIONS/REPORTS: DRAFTING FOR DESIGN AND TECHNCIAL DRAWING SKILLS (Intermediate) DESPRE–2B

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	2
Presenting/ Reporting	4 3 2 1 0	2

STANDARD IS 2 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ interprets, organizes and combines information into a logical sequence for presentation
- ☐ gathers and responds to feedback regarding approach to task and project status
- ☐ plans and uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ produces accurate drawings as per specifications (e.g., dimensioning, title block information)
- ☐ identifies and describes functions used in drawing production (as required)
- ☐ actively participates in interim and final critiques

Content (continued)

- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of drawings produced
  - ☐ accurate identification of types of drawings produced and rationale for their selection
  - ☐ identification of functions (CAD) and/or techniques used to produce drawings (as required)
  - ☐ identify decisions made during project and reasons for these decisions
- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

- ☐ demonstrates effective use of at least two communication media (e.g., voice, visual)
- ☐ maintains acceptable grammatical and technical standards
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates ideas into a logical sequence with sufficient supporting detail
- ☐ responds to questions effectively and in a courteous manner

PRESENTATIONS/REPORTS: FORM, COMPOSITION AND AESTHETICS (Advanced)

DESPRE–3A

Student: ______________________

Teacher: ______________________

Module: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of solution
  - ☐ form, composition and aesthetic quality of the product
  - ☐ judgements made during the designing process
  - ☐ why these judgements were made
  - ☐ the effect they had in shaping the final result

Content (continued)

- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

PRESENTATIONS/REPORTS: COMMUNICATION AND HUMAN FACTORS (Advanced)

DESPRE–3B

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of solution
  - ☐ effectiveness of the designed solution in communicating its message
  - ☐ how well the designed solution addresses identified human factors
  - ☐ judgements made during the designing process
  - ☐ why these judgements were made
  - ☐ the effect they had in shaping the final result

Content (continued)
- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting
- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

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PRESENTATIONS/REPORTS: MATERIALS AND PRODUCTION PROCESSES (Advanced)

DESPRE-3C

Student: ______________________ **Teacher:** ______________________

Module: ______________________ **Date:** ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention solution
  - ☐ strengths and weaknesses of the designed solution
  - ☐ justification for the selection and use of materials
  - ☐ recommendations for production process(es) and quantities to be produced

Content (continued)
- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting
- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

PRESENTATIONS/REPORTS: LIVING ENVIRONMENT STUDIO (Advanced)

DESPRE–3D

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intended solution
  - ☐ effectiveness of the designed solution in addressing form and space
  - ☐ how well the designed solution addresses identified human factors and environmental needs
  - ☐ judgements made during the designing process
  - ☐ why these judgements were made
  - ☐ the effect they had in shaping the final result

Content (continued)

- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

PRESENTATIONS/REPORTS: DRAFTING FOR DESIGN AND TECHNICAL DRAWING SKILLS (Advanced) DESPRE–3E

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of drawings or renderings produced
  - ☐ adequacy of drawings produced for illustrating the design solution
  - ☐ rationale for their selection
  - ☐ effect drawings of renderings had in shaping the final result

Content (continued)
- ☐ ensures accuracy of drawings or renderings as per any specifications
- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting
- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

PROJECT ASSESSMENT: 2-D DESIGN FUNDAMENTALS CHECKLIST

DES1030–1

Student: ______________________ Teacher: ______________________
Module: ______________________ Date: ______________________
Project Description: ____
____

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	1
Teamwork	4 3 2 1 0 N/A	1
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	1

STANDARD IS 1 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

Design Techniques:

Generates Ideas
- ☐ produces thumbnail sketches
- ☐ moves visual components within a defined space
- ☐ considers various grid layouts
- ☐ shows consideration of:
  - ☐ font
  - ☐ style
  - ☐ point size
- ☐ manipulates images and/or typography to create symbolism

Applies Ideas to Produce Layouts
- ☐ uses images within a defined space
- ☐ uses typography within undefined space
- ☐ applies grid(s) as required
- ☐ combines images and/or typography to produce a symbol(s)
- ☐ skills:
  - ☐ cut
  - ☐ paste
  - ☐ measure
  - ☐ transfer

Design Tools:
- ☐ traditional tools
  - ☐ pencil
  - ☐ pen
  - ☐ marker
  - ☐ T-square/set square
  - ☐ parallel rule
  - ☐ knife
  - ☐ waxer/tape
- ☐ computer
- ☐ other

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Design Materials:
- ☐ traditional materials
  - ☐ paper/card
  - ☐ ink
  - ☐ pressure-sensitive lettering
  - ☐ typography sheets
  - ☐ clip art
- ☐ computer software
- ☐ other

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COMMENTS

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PROJECT ASSESSMENT: 3-D DESIGN FUNDAMENTALS CHECKLIST

DES1040–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

Project Description: ____

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	1
Teamwork	4 3 2 1 0 N/A	1
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	1

STANDARD IS 1 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

Design Techniques:

Generates Ideas
- ☐ produces thumbnail sketches or models
- ☐ manipulates three-dimensional components
  - ☐ bends
  - ☐ folds
  - ☐ cuts
  - ☐ shapes
- ☐ joins materials temporarily

Applies Ideas/Techniques
- ☐ uses materials to produce forms
- ☐ selects and uses component parts, (e.g., sprockets, panels, axils, wood strips) in designs
- ☐ uses valuable material (e.g., modelling clay, wire, paper) in designs
- ☐ uses non-valuable material (e.g., wood, styrofoam, metal plate, plexiglass) in designs
- ☐ skills:
  - ☐ molding or shaping
  - ☐ adding to or removing
  - ☐ measuring
  - ☐ cutting
  - ☐ joining/fastening
  - ☐ bending/folding

Design Tools:

- ☐ scissors
- ☐ knife
- ☐ tools for modelling clay
- ☐ saw
- ☐ plyers
- ☐ hammer
- ☐ screw driver
- ☐ other

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- ☐ clamps
- ☐ snips
- ☐ straight edge
- ☐ ruler
- ☐ tape measure
- ☐ square
- ☐ styrofoam cutter

Design Materials:

- ☐ paper
- ☐ card
- ☐ modelling clay
- ☐ wire
- ☐ wood
- ☐ styrofoam
- ☐ other

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- ☐ plastic
- ☐ glue
- ☐ cloth
- ☐ plaster
- ☐ fasteners

COMMENTS

PROJECT ASSESSMENT: CAD FUNDAMENTALS

DES1050–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	1
Teamwork	4 3 2 1 0 N/A	1
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	1

STANDARD IS 1 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ carries out instructions accurately
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ exhibits basic teamwork skills (e.g., cooperation, appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies and accesses commonly used CAD tools, methods and functions
- ☐ reads and interprets pictorial drawings and multiview sketches for pertinent information
- ☐ produces two-dimensional multiview drawing(s) with specified dimensions
- ☐ produces pictorial drawing(s)
- ☐ produces surface developments with specified dimensions
- ☐ prints/plots drawings
- ☐ selects and uses CAD tools, methods and functions to produce multiview drawings using simple three-dimensional objects or pictorial drawings for reference
- ☐ demonstrates the use of layers in one drawing

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ returns clean equipment/materials to storage area

COMMENTS

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PROJECT ASSESSMENT: DRAFTING/DESIGN FUNDAMENTALS **DES1060-1**

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	1
Teamwork	4 3 2 1 0 NA	1
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	1

STANDARD IS 1 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ carries out instructions accurately
- ☐ uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ exhibits basic teamwork skills (e.g., cooperation, appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ recognizes and identifies common pictorial drawing types
- ☐ given samples of multiview drawings identifies:
  - ☐ their common views
  - ☐ discriminates between first angle and third angle projections

Content (continued)
- ☐ produces one of the following drawings:
  - ☐ isometric
  - ☐ oblique (either Cavalier or Cabinet)
  - ☐ perspective (either one-point or two-point)

    or
  - ☐ a drawing(s) appropriate for illustrating assembled surface developments
- ☐ produces at least one multiview drawing

  or
- ☐ produces a surface development
- ☐ uses drafting techniques to illustrate a particular aspect of a designed solution
- ☐ where appropriate, uses drafting techniques to illustrate how parts of a design go together
- ☐ uses general drafting conventions where appropriate

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ returns clean equipment/materials to storage area

COMMENTS

PROJECT ASSESSMENT: CAD APPLICATIONS

DES2030–1

Student: ______________________________

Module: ______________________________

Teacher: ______________________________

Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	2

STANDARD IS 2 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively
- ☐ adheres to routine procedures

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies and accesses commonly used CAD tools, methods and functions
- ☐ reads and interprets pictorial drawings and multiview sketches for pertinent information
- ☐ produces layered fully dimensioned multiview drawings
- ☐ produces fully dimensioned pictorial drawings
- ☐ produces fully dimensional surface developments
- ☐ prints/plots drawings
- ☐ selects and uses CAD tools, methods and functions to produce layered multiview drawings and pictorial drawings using pictorial sketches and/or three-dimensional objects for reference

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ models safe procedures/techniques
- ☐ minimizes waste of materials
- ☐ advises of potential hazards and necessary repairs

COMMENTS

PROJECT ASSESSMENT: DRAFTING/DESIGN APPLICATIONS

DES2040–1

Student: ______________________________

Module: ______________________________

Teacher: ______________________________

Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	2

STANDARD IS 2 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively
- ☐ adheres to routine procedures

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ demonstrates previously learned skills in pictorial drawing and/or in producing surface developments
- ☐ produces an example of two of the following types of drawings based on design projects and describes their purpose and application:
  - ☐ assembly
  - ☐ sectional
  - ☐ auxiliary
- ☐ produces one of the following:
  - ☐ dimensioned multiview drawing(s)
  - ☐ dimensioned surface development(s)
- ☐ given a design brief, selects appropriate drawings types and styles and uses them to accurately illustrate potential design solutions
- ☐ uses appropriate terminology
- ☐ selects and uses appropriate tools and materials as outlined in design briefs

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ models safe procedures/techniques
- ☐ minimizes waste of materials
- ☐ advises of potential hazards and necessary repairs

COMMENTS

PROJECT ASSESSMENT: TECHNICAL DRAWING APPLICATIONS **DES2050–1**

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	1
Equipment and Materials	4 3 2 1 0	2

STANDARD IS 2 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively
- ☐ adheres to routine procedures

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ recognizes the need for specific types of drawings giving examples of their application
- ☐ produces an example of each of the following types of drawings based on sketches provided:
  - ☐ multiview (minimum three views)
  - ☐ detail and/or assembly drawing
  - ☐ sectional and/or auxiliary drawing
  - ☐ exploded view and/or threaded fastener
- ☐ accurately dimensions and notates each drawing
- ☐ produces a pictorial drawing based on the multiview drawing produced
- ☐ follows standard conventions as required for drawings produced
- ☐ interprets standards and codes as they apply to drawings produced
- ☐ uses appropriate terminology

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ models safe procedures/techniques
- ☐ minimizes waste of materials
- ☐ advises of potential hazards and necessary repairs

COMMENTS

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PROJECT ASSESSMENT: THE EVOLUTION OF DESIGN

DES2060–1

Student: ______________________

Module: ______________________

Teacher: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	2

STANDARD IS 2 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively
- ☐ adheres to routine procedures

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ conducts specified research in design
- ☐ accesses a range of appropriate in-school/community resources
- ☐ identifies and explains relationships between past and current designed solutions
- ☐ identifies influences on the solution based on the following considerations:
  - ☐ cultural
  - ☐ global
  - ☐ ethical
  - ☐ environmental
- ☐ presents research findings
- ☐ uses tools, materials and other resources appropriate to the presentation

Equipment and Materials
- ☐ selects and uses appropriate equipment/materials
- ☐ models safe procedures/techniques
- ☐ minimizes waste of materials
- ☐ advises of potential hazards and necessary repairs

COMMENTS

PRESENTATIONS/REPORTS: THE EVOLUTION OF DESIGN

DES2060–2

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	2
Teamwork	4 3 2 1 0 N/A	2
Content	4 3 2 1 0	1
Presenting/ Reporting	4 3 2 1 0	2

STANDARD IS 2 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning
- ☐ sets goals for presentation
- ☐ uses personal initiative to formulate questions and find answers
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ plans and uses time effectively

Teamwork
- ☐ cooperates with group members
- ☐ negotiates solutions to problems
- ☐ shares work appropriately among group members
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ presents/discusses interim findings
  - ☐ describes the area studied
  - ☐ presents interim findings
  - ☐ obtains feedback
  - ☐ incorporates feedback into project

Content (continued)
- ☐ prepares for and actively participates in final presentation and critique:
  - ☐ describe the area studied
  - ☐ present findings
- ☐ submits final project for assessment
- ☐ maintains and uses design journal/sketchbook to make notes (including research notes)
- ☐ provides design journal to teacher as required
- ☐ includes project and design journal in portfolio

Presenting/Reporting
- ☐ demonstrates effective use of at least two communication media (e.g., voice, visual)
- ☐ maintains acceptable grammatical and technical standards through proofreading and editing
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates ideas into a logical sequence with sufficient supporting detail
- ☐ states a conclusion by synthesizing the information gathered
- ☐ provides a reference list that includes two or more relevant information sources

PROJECT ASSESSMENT: LIVING ENVIRONMENT STUDIO 1 **DES3070–1**

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies the effect of environment on design
- ☐ presents three examples of the impact of a living environment on human beings
- ☐ presents three examples of how factors can affect architectural, environmental or interior design
- ☐ discusses the responsibility design has toward the human and natural environment
- ☐ addresses two design problems:
  - ☐ write a design brief and identify a plan for arriving at a solution
  - ☐ develop a designed solution to each problem
- ☐ selects and uses elements and principles of design in project and describes how their use has contributed to the aesthetics and function of the solution
- ☐ rationalizes decisions made during designing and indicates how these decisions affected the results
- ☐ identifies, selects and uses appropriate techniques to produce a designed solution
- ☐ increases proficiency with skills and techniques learned at the introductory and intermediate levels
- ☐ recognizes and identifies mathematical and scientific principles as they apply in the context of design work

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: LIVING ENVIRONMENT STUDIO 2

DES3080–1

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ discusses how form and space are used in the context of architectural, environmental or interior design
- ☐ compares the general characteristics of living and working spaces of two different communities
- ☐ compares a similar environmental space (e.g., a house) from two cultures
- ☐ discusses the responsibility design has toward the human and natural environment
- ☐ address two new design problems or continue development of design problems addressed in DES3070
- ☐ selects and uses elements and principles of design in project and describes how their use has contributed to the aesthetics and function of the solution
- ☐ rationalizes decisions made during designing and indicates how these decisions affected the result
- ☐ identifies, selects and uses appropriate techniques to produce a designed solution
- ☐ increases proficiency with skills and techniques learned at the introductory and intermediate levels

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: LIVING ENVIRONMENT STUDIO 3 **DES3090–1**

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ identifies materials, production processes and techniques commonly used to construct, fabricate and finish living and working spaces

Content (continued)

- ☐ examines different types of materials for their characteristics and identifies how their use has evolved in design and how some have been replaced by other types of materials
- ☐ specifies two different materials and production scenarios specific to the same design project
- ☐ specifies materials for producing a design and rationalizes their selection based on:
  - ☐ their contribution to the structure
  - ☐ affect on the durability of the design
- ☐ resolves construction concerns
- ☐ develops a plan for producing a designed solution
- ☐ identifies, selects and uses appropriate tools, materials and techniques as required
- ☐ increases proficiency with skills and techniques learned at the introductory and intermediate levels
- ☐ recognizes and identifies mathematical and scientific principles as they apply in the context of design work

Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PRESENTATIONS/REPORTS: LIVING ENVIRONMENT STUDIO 3

DES3090–2

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 NA	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ actively participates in interim and final critiques
- ☐ presents and discusses project work including:
  - ☐ outline of project and intention of solution
  - ☐ demonstrate an understanding of the relationship between materials and products and his or her use
  - ☐ justify the selection/specification of materials and production processes for product manufacturing
- ☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings as required
- ☐ provides design journal to teacher as required
- ☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

COMMENTS

PROJECT ASSESSMENT: CAD MODELLING STUDIO **DES3100–1**

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies, selects and uses appropriate CAD software in the context of design
- ☐ identifies, selects and applies CAD tools, methods and functions to resolve specified design problems
- ☐ generates a three-dimensional model image in response to a problem specified in a project brief

OR
- ☐ generates a set of working drawings in response to a problem specified in a project brief
- ☐ prints/plots drawings

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PRESENTATIONS/REPORTS: CAD MODELLING STUDIO

DES3100–2

Student: ______________________

Teacher: ______________________

Module: ______________________

Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

☐ sets goals for presentation
☐ accesses a range of relevant information sources and recognizes when additional information is required
☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
☐ uses time effectively

Teamwork

☐ cooperates with group members
☐ shares work appropriately among group members
☐ negotiates with sensitivity solutions to problems
☐ displays effective communication skills
☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content (continued)

☐ presents and discusses project work including:
  ☐ software used
  ☐ justification of software selection based on strengths and weaknesses
  ☐ identification of functions and/or techniques used to produce drawings (as required)
☐ presents accurate drawings and models produced as per specifications
☐ collects ideas and represents these ideas in his or her design journal/sketchbook through sketches and/or drawings and/or notes as required
☐ provides design journal to teacher as required
☐ selects sketches, drawings and/or models (or photographs, video images of models) and includes them in a design portfolio

Presenting/Reporting

☐ sets goals for presentation
☐ accesses a range of relevant information sources and recognizes when additional information is required
☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
☐ uses time effectively

COMMENTS

PROJECT ASSESSMENT: DRAFTING/DESIGN STUDIO 1

DES3110–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ produces at least one pictorial line drawing of a complex design concept
- ☐ produces at least one drawing, accurate in proportion and scale, using freehand drawing techniques
- ☐ uses drafting instruments and/or CAD to produce an illustrative view of a designed solution
- ☐ selects and uses appropriate drawing instruments materials and computer applications
- ☐ addresses design during drawing projects with attention to:
  - ☐ proportion
  - ☐ scale
  - ☐ composition
  - ☐ codes and standards (where applicable)

Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: DRAFTING/DESIGN STUDIO 2

DES3120-1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ develops a set of explanatory drawings (based on drawings completed in previous modules or provided by the teacher) that effectively communicates aspects of the designed solution
- ☐ uses freehand techniques to produce additional explanatory drawings
- ☐ selects and uses drafting instruments and/or CAD to produce explanatory views
- ☐ assesses the most appropriate way to illustrate the assembly, function and/or use of a designed solution
- ☐ applies this method to illustrate a designed solution

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

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PROJECT ASSESSMENT: DRAFTING/DESIGN STUDIO 3

DES3130–1

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ develops a set of rendered drawings (based on drawings completed in previous modules or provided by the teacher)
- ☐ drawings will communicate aspects of the designed solution such as:
  - ☐ general appearance
  - ☐ textures
  - ☐ materials
  - ☐ the design in context
  - ☐ different lighting conditions
  - ☐ colour
- ☐ demonstrates two rendering techniques
- ☐ assesses the most appropriate way to render a specific drawing
- ☐ applies this method to render a drawing in a two-dimensional format
- ☐ presents board of rendered illustrations

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: TECHNICAL DRAWING STUDIO 1 **DES3140–1**

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ produces at least one:
  - ☐ section
  - ☐ elevation
  - ☐ auxiliary
- ☐ uses sketches and/or multiview drawings (prepared in previous modules or provided by the teacher):
  - ☐ identifies and selects appropriate additional views
  - ☐ produces these drawings
- ☐ accurately dimensions drawings as required
- ☐ uses codes, specifications and conventions as required
- ☐ identifies, selects and uses techniques, tools, materials and other requirements as per project requirements

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: TECHNICAL DRAWING STUDIO 2

DES3150–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ produces at least two of each of the following:
  - ☐ intersections
  - ☐ surface developments
- ☐ uses sketches and/or multiview drawings (prepared in previous modules or provided by the teacher):
  - ☐ identifies and selects appropriate additional drawings
  - ☐ produces these drawings
- ☐ accurately dimensions drawings as required
- ☐ uses codes, specifications and conventions as required
- ☐ identifies, selects and uses techniques, tools, materials and other requirements as per project requirements

Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PROJECT ASSESSMENT: TECHNICAL DRAWING STUDIO 3

DES3160–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ produces a complete set of working drawings for the fabrication, manufacturing or construction of a designed item
- ☐ ensures the selected drawing types satisfy the detail needs
- ☐ includes all dimensioning details required for production
- ☐ ensures all codes are met in the specifications indicated
- ☐ identifies, selects and uses techniques, tools, materials and other requirements as per project requirements
- ☐ rationalizes the selection based on their properties

Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

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PROJECT ASSESSMENT: VISUALIZING THE FUTURE

DES3170–1

Student: ______________________________ Teacher: ______________________________

Module: ______________________________ Date: ______________________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ describes the role/challenges future designers might play/encounter
- ☐ describes how this role/challenges will differ from those faced by current designers
- ☐ writes a design brief detailing a problem
- ☐ plans for resolution of the design brief
- ☐ conducts research in future design and applies it to the design problem
- ☐ generates a designed solution
- ☐ rationalizes decisions based on research findings

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ weighs and measures accurately and efficiently
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

COMMENTS

PRESENTATIONS/REPORTS: VISUALIZING THE FUTURE

DES3170-2

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ presents/discusses interim findings:
  - ☐ describes the area studied
  - ☐ presents interim findings
  - ☐ obtains feedback
  - ☐ incorporates feedback into project

Content (continued)

- ☐ prepares for and actively participates in final presentation and critique:
  - ☐ describes the area studied
  - ☐ presents findings
- ☐ submits final project for assessment
- ☐ maintains and uses design journal/sketchbook to make notes (including research notes)
- ☐ provides design journal to teacher as required
- ☐ includes project and design journal in portfolio

Presenting/Reporting

- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

PROJECT ASSESSMENT: THE DESIGN PROFESSION

DES3180–1

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING						STANDARD
Management	4	3	2	1	0		3
Teamwork	4	3	2	1	0	N/A	3
Content	4	3	2	1	0		2
Equipment and Materials	4	3	2	1	0		3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ identifies three issues faced by designers in a small company
- ☐ describes how these may be dealt with
- ☐ conducts research into the business and profession of design
- ☐ identifies and lists opportunities for design practice in immediate/adjacent community
- ☐ identifies qualifications required for entering a design practice
- ☐ prepares a plan for a small design company including:
  - ☐ design specialty
  - ☐ prospective clients
  - ☐ production logistics
  - ☐ financing
  - ☐ promotion
  - ☐ other(s) as assigned

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ minimizes waste of materials

COMMENTS

PRESENTATIONS/REPORTS: THE DESIGN PROFESSION

DES3180–2

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

- ☐ sets goals for presentation
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
- ☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

- ☐ presents/discusses interim findings
  - ☐ describes the business focus selected
  - ☐ presents interim findings about
    - ☐ business focus
    - ☐ issues faced within the business focus
    - ☐ business opportunities
    - ☐ educational qualifications
  - ☐ obtains feedback

Content (continued)

- ☐ incorporates feedback into project
- ☐ prepares for and actively participates in final presentation and critique:
  - ☐ describes the business focus selected
  - ☐ presents findings about
    - ☐ business focus
    - ☐ issues faced within the business focus
    - ☐ business opportunities
- ☐ educational qualifications
- ☐ submits final project for assessment
- ☐ maintains and uses design journal/sketchbook to make notes (including research notes)
- ☐ provides design journal to teacher as required
- ☐ includes project and design journal in portfolio

Presenting/Reporting

- ☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
- ☐ maintains acceptable grammatical and technical standards
- ☐ uses appropriate technical terms and supporting detail
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ gives evidence of adequate research through a reference list or through discussion
- ☐ responds to questions effectively and in a courteous manner
- ☐ considers possible revisions and next steps

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PROJECT ASSESSMENT: PORTFOLIO PRESENTATION

DES3190-1

Student: ______________________ Teacher: ______________________

Module: ______________________ Date: ______________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Management	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	2
Equipment and Materials	4 3 2 1 0	3

STANDARD IS 3 IN EACH APPLICABLE CRITERIA UNLESS OTHERWISE STATED.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Management
- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork
- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills
- ☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content
- ☐ determines the purpose of the portfolio
- ☐ selects most appropriate work for inclusion in portfolio and rationalizes selection
- ☐ prepares selected work as required
- ☐ writes a supporting page of introduction including:
  - ☐ introduction of the student
  - ☐ short description of portfolio contents
  - ☐ rationale for the work presented

Equipment and Materials
- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ minimizes waste of materials

COMMENTS

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PRESENTATIONS/REPORTS: PORTFOLIO PRESENTATION

DES3190–2

Student: ____________________ Teacher: ____________________

Module: ____________________ Date: ____________________

CRITERIA	OBSERVATION/ RATING	STANDARD
Preparation and Planning	4 3 2 1 0	3
Teamwork	4 3 2 1 0 N/A	3
Content	4 3 2 1 0	3
Presenting/ Reporting	4 3 2 1 0	3

STANDARD IS 3 UNDER EACH APPLICABLE CRITERIA.

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

CRITERIA

The student:

Preparation and Planning

☐ sets goals for presentation
☐ accesses a range of relevant information sources and recognizes when additional information is required
☐ interprets, organizes and combines information in creative and thoughtful ways for effective presentation
☐ assesses and refines approach to task and project status based on feedback and reflection from presentation
☐ uses time effectively

Teamwork

☐ cooperates with group members
☐ shares work appropriately among group members
☐ negotiates with sensitivity solutions to problems
☐ displays effective communication skills
☐ exhibits basic teamwork skills (e.g., appropriate conduct, leadership, commitment, negotiation, sharing)

Content

☐ identifies the target of the portfolio:
  ☐ who the portfolio is for
  ☐ specifies requirements (if any)

Content (continued)

☐ presents portfolio contents:
  ☐ projects included
  ☐ what these projects demonstrate (scope)
  ☐ how the portfolio represents the student's work
  ☐ strengths/weaknesses of the portfolio
☐ obtains feedback
☐ revises portfolio as required
☐ submits final portfolio for assessment

Presenting/Reporting

☐ demonstrates effective use of a variety of communication media (e.g., voice, media, real objects)
☐ maintains acceptable grammatical and technical standards
☐ uses appropriate technical terms and supporting detail
☐ provides an introduction that describes the purpose and scope of the project
☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
☐ gives evidence of adequate research through a reference list or through discussion
☐ responds to questions effectively and in a courteous manner
☐ considers possible revisions and next steps

DESIGN STUDIES

SECTION H: LINKAGES/TRANSITIONS

This section of the Guide has been designed to provide an overview of linkages and transitions of CTS modules with a number of organizations. The charts and information presented in this section will assist CTS students and teachers in understanding the potential application of CTS modules as students move into the workplace.

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LINKAGES/TRANSITIONS

LINKAGES

With Other CTS Strands

There are many linkages between Design Studies and other CTS strands, and between Design Studies and other secondary programs. The diverse nature of the Design Studies strand also extends and reinforces linkages to a variety of post-secondary studies and career areas.

The notion of design can be found in the many CTS strands. Examples include:

- Fashion Studies—pattern design, fashion illustration
- Communication Technology—graphic design, photographic design, layout and design, reproduction technologies, presentation and communication
- Construction Technologies—structural design, architectural design, furniture design, materials and production processes, mass-production, pre-fabrication
- Fabrication Studies—part and component design, Computer Aided Manufacturing (CAM)
- Management and Marketing—display design, advertising design
- Enterprise and Innovation—product conception, product promotion.

Potential linkages of Design Studies with other CTS strands, determined by course emphasis and area of specialization, are identified in this section (see "Design Studies: Connections with Other CTS Strands").

With Other Secondary Programs

The Relationship of Design Studies (Introductory Level) to Art 10 Program

The relationship between Design Studies strand (Introductory Level) and the Art 10 program has both commonalties and differences. The commonalties relate to notions of creativity, the development/use of some skills and the identification and application of the elements and principles of design. The differences centre around a range of skills and their application, and the focus and intent of the two programs. Examples of this relationship can be found within the respective philosophy, goals and scope and sequence of the two programs.

Philosophy:

The philosophy of the Art 10 program focuses on the early development of the artist and some of the basic skills required to be successful in this area. The Art 10 curriculum identifies the following within the program philosophy:

- organization of visual material
- interpretation and making sense of visual stimuli
- valuing art
- expression of feelings
- thinking/behaving as an artist
- making and defending qualitative judgements about art works.

Design Studies focuses on two philosophical elements, stating them as:

- "a creative problem-solving process, which begins with identifying a specific human need and results ideally, in a product or situation that improves or enhances some aspect of our lives"
- "students learning to solve visual, structural and organizational problems using the context of their environment, their other classes and their community experiences."

Based on these statements, both programs ask students to use and create visual images and make and defend decisions. However, the philosophical base of each program is quite different. The focus of the Art 10 program is on personal expression and the response of individuals to art. Design Studies is concerned with identifying and resolving problems through appropriate means.

Goals:

Three goals are identified for the Art 10 program:

- drawing or delineations (all the ways we record visual information and discoveries)
- compositions or structures (all the ways images are put together to create meaning)
- encounters with art (where we meet and how we respond to visual imagery).

Each of these has three or four sub-goals dealing with skill development, creative investigation and the relationship of art to culture. One of the sub-goals under drawing and delineations is to "develop the ability to investigate visual relationships in their recorded images and in the environment." This goal suggests notions of problem solving.

Design Studies lists 15 goals for the program including:

- creativity and innovation
- developing aesthetic awareness
- conducting research
- identifying and solving problems
- working on two- and three-dimensional projects
- working individually and as team members
- using technology appropriately and safely
- developing effective communication skills
- recognizing and dealing with moral, ethical and legal issues as they pertain to design
- recognizing the potential impact of design on the environment.

Again the focus of the program is on developing creative and appropriate solutions to problems and recognizing and addressing the many factors that may influence design decisions. Technical skills and knowledge students may develop through the design program may be similar to those developed through the Art 10 program but the focus of the learning is distinctly different.

Scope and Sequence:

The Art 10 program as a whole has identified three main areas within the scope and sequence (drawings, compositions, encounters), while Design Studies (Introductory Level) has identified six (sketching/drawing/modelling, the design process, two-dimensional design, three-dimensional design, Computer-assisted Design [CAD], drafting for design). Specific outcomes identified within Art 10 include development of drawing skills, application of elements and principles of design in compositions, development of skills in art criticism and the relationship of art within society. Development of drawing skills and the identification and use of the elements and principles of design are also dealt with in Design Studies as these are two of the building blocks of design activity. While these two themes are the same, the depth of skills and knowledge associated with each can be quite different in the two programs. And as previously indicated their application is based on quite different philosophies and goals.

Summary:

While there is a relationship between Design Studies and Art 10 in some of the basic skills and knowledge that will be developed by students, the distinction between the programs comes in their respective foci; one focusing on personal expression, the other on resolving problems effectively.

Design and Science

Design also links with the elementary and junior high science programs. Elementary Science is addressing Design and Technology, including problem solving (the scientific method being closely related to a process of design). Specific themes include Materials, Movement, Structures and Control.

Junior high science has within it three major areas of emphasis: Nature of Science, Science and Technology; Science, Technology and Society. The program modality is based on the use of the inquiry method, which strongly parallels design methodology. Scientific inquiry skills are identified in the Nature of Science. They are reinforced by Technological Problem-Solving Skills (a process of design) identified within Science and Technology and presented as:

- understanding the problem
  - identify the purpose
  - identify specific requirements (specifications)
- developing a plan
  - identifying alternatives
  - planning and designing
- carrying out the plan
  - testing the design
  - troubleshooting
- evaluating
  - evaluating the design
  - evaluating the planning process.

Furthermore, the Science and Technology component identifies seven additional goals including having students:

- appreciate "good design, taking into consideration function, safety, aesthetics and environmental effects"
- be willing to "take the initiative in dealing with practical problems"
- be aware of "alternatives in the approach to technological problems"
- appreciate the "need for technological devices and processes to serve human needs."

Many of the societal aspects of "design" are supported by the Science, Technology and Society component with respect to attitude, e.g., "appreciation of the need for informed decision making at both personal and societal levels" and through the decision-making skills identified. Identifying issues and alternatives, researching, reflecting and deciding, taking action and evaluating are again components of the process of design.

The Grade 7 science program includes units on Structure and Design, and Force and Motion, both of which relate directly to the Three-dimensional and Living Environments modules in Design Studies. Similarly, Grade 8 science includes Energy and Machines, Consumer Product Testing and Interactions and Environments, and Grade 9 includes Fluids and Pressure, Heat Energy: Transfer and Conservation, and Electromagnetic Systems. These again support the Three-dimensional Design and Living Environments foci in Design Studies.

Potential linkages of Design Studies with other core and complementary subject areas across the curriculum are identified in this section (see "Design Studies: Connections Across the Curriculum").

To Other Government Initiatives

In 1991, the federal Department of Communications initiative on design in Canada drew together representatives from the design community to look at the state of design in Canada and to discuss its future. Representations were made by leading designers at that time. The Design Studies program has received input from contributors to this process and has therefore in part been shaped by the initiative.

TRANSITIONS

To the Community/Workplace

There is limited direct entry into the workplace from Design Studies, as the development of marketable skills in design requires post-secondary training. As one business-based member of the communication network commented, the Design Studies "course is very ambitious—covers ALL design, i.e., architectural, graphic, industrial, interior, set, etc. Any one of these is enough for a four-year program." Two Design Studies modules, The Design Profession and Portfolio Presentation, deal specifically with helping students prepare for and successfully enter post-secondary design schools.

Information from the National Occupational Classification (NOC) regarding occupations in design-related areas that can be accessed upon completion of high school is provided in this section (see "Design Studies: Related Occupations".

To Related Post-secondary Programs

There is articulation between Design Studies and programs offered at the post-secondary level. Students wishing to pursue a design career will in most instances seek additional training in one of the following careers:

- Architect
- Draftsman
- Engineer
- Exhibition/Display Designer
- Fashion Designer
- Furniture Designer
- Graphic Designer
- Illustrator
- Industrial (Product) Designer
- Interior Designer
- Landscape Designer
- Set Designer
- Other emerging career areas.

An outline of post-secondary institutions in Alberta currently offering programs in design studies-related areas is provided in this section (see "Design Studies: Summary of Related Post-secondary Programs".

CREDENTIALLING

There are no credentialling opportunities for Design Studies modules.

LINKAGES – *Design Studies: Connections with Other CTS Strands*

Design Studies Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Design Skills, Processes and Applications																					
DES1010: Sketch, Draw & Model			▤	▤	▤	▤				▤	▤							▤			
DES1020: The Design Process			■		■	▤			■	■	■		▤					▤			
DES1030: 2-D Design Fundamentals			■								▤				▤						
DES1040: 3-D Design Fundamentals					▤					▤											
DES2010: 2-D Design Applications			■												▤			▤			
DES2020: 3-D Design Applications			▤		▤					▤	▤		▤						▤		
DES3010: 2-D Design Studio 1			■												▤			▤			
DES3020: 2-D Design Studio 2			■												▤			▤			
DES3030: 2-D Design Studio 3			■												▤			▤			
DES3040: 3-D Design Studio 1			▤		▤					▤	▤		▤					▤			
DES3050: 3-D Design Studio 2			▤		▤					▤	▤		▤					▤			
DES3060: 3-D Design Studio 3			▤		▤					▤	▤		▤					▤			
DES3070: Living Environment Studio 1					▤						▤										
DES3080: Living Environment Studio 2					▤						▤										
DES3090: Living Environment Studio 3					▤						▤										
Theme: Drafting for Design & Technical Drawing Skills																					
DES1050: CAD Fundamentals					▤		▤			▤	■										
DES1060: Drafting/Design Fund			▤		▤		▤			▤	▤										
DES2030: CAD Applications					▤		▤			▤	■										
DES2040: Drafting/Design Applications					▤		▤			▤	▤										
DES2050: Technical Drawing Applications					▤		▤			▤											
DES3100: CAD Modelling Studio					▤		▤			▤											
DES3110: Drafting/Design Studio 1					▤		▤			▤											
DES3120: Drafting/Design Studio 2					▤		▤			▤											
DES3130: Drafting/Design Studio 3					▤					▤											
DES3140: Technical Drawing Studio 1					▤					▤											
DES3150: Technical Drawing Studio 2					▤					▤											
DES3160: Technical Drawing Studio 3					▤					▤											
Theme: Business/Issues/History																					
DES2060: The Evolution of Design			▤		▤	▤	▤			▤	▤							▤			
DES3170: Visualizing the Future			▤		▤	▤	▤			▤	▤							▤			
DES3180: The Design Profession			▤						▤		▤										
DES3190: Portfolio Presentation	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤		▤	▤	▤	▤

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Across the Curriculum

	Junior High							Senior High										
Design Studies Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences
Theme: Design Skills, Processes and Applications																		
DES1010: Sketch, Draw & Model							■										■	
DES1020: The Design Process				■			■				■			▤			■	
DES1030: 2-D Design Fundamentals							■										■	
DES1040: 3-D Design Fundamentals				▤			▤										▤	
DES2010: 2-D Design Applications							▤										▤	
DES2020: 3-D Design Applications				▤													▤	
DES3010: 2-D Design Studio 1																	▤	
DES3020: 2-D Design Studio 2																	▤	▤
DES3030: 2-D Design Studio 3																	▤	
DES3040: 3-D Design Studio 1																	▤	
DES3050: 3-D Design Studio 2																	▤	▤
DES3060: 3-D Design Studio 3														▤			▤	
DES3070: Living Environment Studio 1												▤		▤				▤
DES3080: Living Environment Studio 2														▤				
DES3090: Living Environment Studio 3														▤				
Theme: Drafting for Design & Technical Drawing Skills																		
DES1050: CAD Fundamentals																		
DES1060: Drafting/Design Fund																		
DES2030: CAD Applications																		
DES2040: Drafting/Design Applications																		
DES2050: Technical Drawing Applications																		
DES3100: CAD Modelling Studio																		
DES3110: Drafting/Design Studio 1																		
DES3120: Drafting/Design Studio 2																		
DES3130: Drafting/Design Studio 3																		
DES3140: Technical Drawing Studio 1																		
DES3150: Technical Drawing Studio 2																		
DES3160: Technical Drawing Studio 3																		
Theme: Business/Issues/History																		
DES2060: The Evolution of Design							▤										■	
DES3170: Visualizing the Future							▤										■	
DES3180: The Design Profession																	▤	
DES3190: Portfolio Presentation							▤	▤									■	

Provides many direct links with competencies content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts ■

Provides some links with course content, usually through the application of related technologies and/or processes ▤

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elation of Design Studies to Practical Arts: *Drafting 12–2 2*★

	DRAFTING 12-22-32																																						
DESIGN STUDIES MODULES	**DRAFTING 12**	Introduction to Drafting	Drafting Equipment	Geometric Construction	Reproduction of Drawings	Shape Description	Size Description	Auxiliary Views	Sectioning	**DRAFTING 22A**	Shape and Size Description	Fasteners - Mechanical	Fasteners - Non-mechanical	Forming Processes	Elementary Piping	Detail and Assembly Drawings	Computer Graphics (optional)	**DRAFTING 22B**	Architectural Drafting Practices	Planning	Structural Systems	Working Drawings	Perspective Drawing	Computer Graphics (optional)	**DRAFTING 22C**	Surveying/Cartography	**DRAFTING 32A**	Auxiliary Views	Revolutions	Intersections and Surface Development	Resolution of Forces	Piping Drawings	**DRAFTING 32B**	Advanced Architectural Planning and Design	Structural Systems	Working Drawings	Computer Graphics (optional)	**DRAFTING 32C**	Practical Extensions
DES1010: Sketch, Draw & Model						✓					✓												✓																
DES1020: The Design Process																																							
DES1030: 2-D Design Fundamentals																																							
DES1040: 3-D Design Fundamentals																																							
DES1050: CAD Fundamentals																	✓							✓													✓		
DES1060: Drafting/Design Fundamentals		✓	✓		✓	✓	✓				✓												✓					✓											
DES2010: 2-D Design Applications																																							
DES2020: 3-D Design Applications																																							
DES2030: CAD Applications																	✓							✓													✓		
DES2040: Drafting/Design Applications								✓	✓							✓												✓											
DES2050: Technical Drawing Applications								✓	✓			✓				✓												✓											
DES2060: The Evolution of Design																																							
DES3010: 2-D Design Studio 1																																							
DES3020: 2-D Design Studio 2																																							
DES3030: 2-D Design Studio 3																																							
DES3040: 3-D Design Studio 1																																							
DES3050: 3-D Design Studio 2																																							
DES3060: 3-D Design Studio 3																																							
DES3070: Living Environment Studio 1																			✓	✓			✓											✓					
DES3080: Living Environment Studio 2																			✓		✓													✓	✓				
DES3090: Living Environment Studio 3																			✓															✓					
DES3100: CAD Modelling Studio																	✓							✓													✓		
DES3110: Drafting/Design Studio 1																																		✓					
DES3120: Drafting/Design Studio 2																																							
DES3130: Drafting/Design Studio 3																							✓																
DES3140: Technical Drawing Studio 1								✓	✓													✓						✓											
DES3150: Technical Drawing Studio 2																													✓	✓									
DES3160: Technical Drawing Studio 3																						✓																	
DES3170: Visualizing the Future																																				✓			
DES3180: The Design Profession																																							
DES3190: Portfolio Presentation																																							

★September 1997: All practical arts courses replaced by Career and Technology Studies.

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Correlation of Design Studies to Practical Arts: Graphic Arts 22–32★

	GRAPHIC ARTS 22-32																											
	GRAPHIC ARTS 22A	Introduction	Image Creation	**GRAPHIC ARTS 22B**	History	Safety	Maintenance	Preparation and Operation	Press Operation	Inks and their Properties	**GRAPHIC ARTS 22C**	Safety	Photography - Black and White (Basic)	Photography - Black and White (Adv)	Colour Photography	**GRAPHIC ARTS 32A**	Process Camera	**GRAPHIC ARTS 32B**	History	Safety	Papers	Bindery Operations	Packaging	Related Operations	Maintenance	Careers	**GRAPHIC ARTS 32C**	Practical Extentions
DES1010: Sketch, Draw & Model						✓														✓								
DES1020: The Design Process						✓														✓								
DES1030: 2-D Design Fundamentals						✓							✓		✓					✓								
DES1040: 3-D Design Fundamentals						✓														✓								
DES1050: CAD Fundamentals						✓														✓								
DES1060: Drafting/Design Fundamentals						✓														✓								
DES2010: 2-D Design Applications			✓			✓							✓	✓	✓					✓								
DES2020: 3-D Design Applications						✓														✓								
DES2030: CAD Applications						✓														✓								
DES2040: Drafting/Design Applications						✓														✓								
DES2050: Technical Drawing Applications						✓														✓								
DES2060: The Evolution of Design		✓			✓	✓													✓	✓	✓			✓		✓		
DES3010: 2-D Design Studio 1						✓														✓								
DES3020: 2-D Design Studio 2						✓														✓								
DES3030: 2-D Design Studio 3						✓							✓	✓	✓		✓			✓	✓		✓			✓		
DES3040: 3-D Design Studio 1						✓														✓								
DES3050: 3-D Design Studio 2						✓														✓								
DES3060: 3-D Design Studio 3						✓														✓								
DES3070: Living Environment Studio 1						✓														✓								
DES3080: Living Environment Studio 2						✓														✓								
DES3090: Living Environment Studio 3						✓														✓								
DES3100: CAD Modelling Studio						✓														✓								
DES3110: Drafting/Design Studio 1						✓														✓								
DES3120: Drafting/Design Studio 2						✓														✓								
DES3130: Drafting/Design Studio 3						✓														✓								
DES3140: Technical Drawing Studio 1						✓														✓								
DES3150: Technical Drawing Studio 2						✓														✓								
DES3160: Technical Drawing Studio 3						✓														✓								
DES3170: Visualizing the Future						✓														✓						✓		
DES3180: The Design Profession						✓														✓						✓		
DES3190: Portfolio Presentation						✓														✓								

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Correlation of Design Studies to Practical Arts: Visual Communications 10–20–30, 12–22–32★

	VISUAL COMMUNICATION 10-20-30													VISUAL COMMUNICATION 12-22-32																											
														12					22A								22B				22C		32A				32B					32 C
DESIGN STUDIES MODULES	Introduction to Offset Lithography	Process Photography - Line	Process Photography - Half Tones	Layout and Design	Topographical and Architectural Drafting	Relief Printing	Screen Process Printing	Black and White Photography - Basic	Black and White Photography - Advanced	Colour Photography	Mechanical Drafting	Customer Service	Offset Printing Process	Introduction	Image Creation	Image Conversion	Reproduction Process	Finishing Procedures (Portfolio)	Introduction	Image Creation	Image Conversion	Reproduction Process	Three Dimensional Design	Perspective	Visual Merchandising	Promotional Display	Introduction	Image Creation	Image Conversion	Reproduction Process	Image Creation	Reproduction Process	Image Creation	Image Conversion	Reproduction Process	Finishing Process	The Information Process	Image Creation	Image Conversion	Reproduction Process	Finishing Process	Practical Extensions
DES1010: Sketch, Draw & Model				✓	✓		✓								✓			✓						✓																	✓	
DES1020: The Design Process	✓			✓											✓			✓					✓																		✓	
DES1030: 2-D Design Fundamentals	✓			✓			✓	✓		✓			✓		✓			✓																							✓	
DES1040: 3-D Design Fundamentals																		✓					✓																		✓	
DES1050: CAD Fundamentals																		✓																							✓	
DES1060: Drafting/Design Fundamentals					✓						✓							✓						✓																	✓	
DES2010: 2-D Design Applications	✓			✓				✓	✓	✓			✓		✓			✓		✓	✓			✓							✓										✓	
DES2020: 3-D Design Applications																		✓		✓	✓		✓																		✓	
DES2030: CAD Applications																		✓																							✓	
DES2040: Drafting/Design Applications											✓							✓																							✓	
DES2050: Technical Drawing Applications											✓							✓																							✓	
DES2060: The Evolution of Design																		✓													✓										✓	
DES3010: 2-D Design Studio 1				✓										✓				✓													✓		✓					✓			✓	
DES3020: 2-D Design Studio 2				✓														✓													✓		✓					✓			✓	
DES3030: 2-D Design Studio 3				✓								✓						✓			✓	✓							✓	✓		✓		✓	✓	✓			✓		✓	
DES3040: 3-D Design Studio 1														✓				✓					✓		✓	✓															✓	
DES3050: 3-D Design Studio 2																		✓					✓		✓	✓															✓	
DES3060: 3-D Design Studio 3																		✓					✓		✓	✓															✓	
DES3070: Living Environment Studio 1																		✓																							✓	
DES3080: Living Environment Studio 2																		✓																							✓	
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DES3100: CAD Modelling Studio																		✓																							✓	
DES3110: Drafting/Design Studio 1																		✓																							✓	
DES3120: Drafting/Design Studio 2																		✓																							✓	
DES3130: Drafting/Design Studio 3																		✓																							✓	
DES3140: Technical Drawing Studio 1																		✓																							✓	
DES3150: Technical Drawing Studio 2																		✓																							✓	
DES3160: Technical Drawing Studio 3																		✓																							✓	
DES3170: Visualizing the Future																		✓													✓										✓	
DES3180: The Design Profession														✓				✓	✓								✓														✓	
DES3190: Portfolio Presentation																		✓																		✓					✓	

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TRANSITIONS—*Design Studies: Related Occupations*

Information for this chart was obtained from the National Occupational Classification (NOC) descriptions:

Educational Requirements:

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupation Profile	NOC#	D	C	B	A
Aerospace Engineer	2146				✓
Architect	2151				✓
Architectural Technologists and Technicians	2251			✓	
Ceramic Engineer	2142				✓
Chemical Engineer	2134				✓
Chemical Engineering Technologist	2211			✓	
Civil Engineer	2131				✓
Civil Engineering Technologists and Technicians	2231			✓	
Drafting Technologists and Technicians	2253			✓	
Engineering Design and Drafting Technologists	2253			✓	
Exhibit Designer	5252	✓		✓	
Industrial Designer	2252			✓	✓
Industrial and Manufacturing Engineers	2141				✓
Industrial Engineering Technologist	2233			✓	
Interior Designer	5242			✓	✓
Jeweler	7344	✓		✓	
Landscape Architect	2152				✓
Landscape Architectural Technologist	2225			✓	
Mechanical Engineer	2132				✓
Mechanical Engineering Technologist	2232			✓	
Metallurgical (Materials) Engineer	2142				✓
Other Professional Engineers	2148				✓
Robotics Technologist	2241			✓	
Theatre Designer	5243			✓	✓
Upholsterer	7341	✓		✓	
Urban and Land Use Planners	2153				✓

TRANSITIONS – *Design Studies: Summary of Related Post-secondary Programs**

	PUBLIC COLLEGES											APPRENTICESHIP TRADE	PRIVATE COLLEGES					TECH. INST.		Banff	UNIVERSITIES			VOCATIONAL COLLEGES			
	Alberta College of Art & Design	Fairview College	Grande Prairie Regional College	Grant MacEwan Community College	Keyano College	Lakeland College	Lethbridge Community College	Medicine Hat College	Mount Royal College	Olds College	Red Deer College		Augustana University College	Canadian Union College	Concordia College	King's University College, The	North American Baptist College	Northern Alberta Institute of Technology	Southern Alberta Institute of Technology	Banff Centre	University of Alberta	University of Calgary	University of Lethbridge	AVC - Calgary	AVC - Edmonton	AVC - Lac La Biche	AVC - Lesser Slave Lake
Horticulture/Landscape Design/Gardening										CD		4y						D						C			
Architectural/Computer-aided Drafting (CAD)							D												V								
Architectural Technology																		D	D								
Architectural/Environmental Design																						M					
Geographical/Regional/Community/Urban Planning & Design																		D				M	BM				
Interior Design/Technology						D			D									D			C						
Art / Art History / Visual Arts	D(4y)		CD 2t	D	CD 2t			D2t			D2t		B	V						V	BM	BM	BM				
Commercial Signwriting																		C									
Photography / Photographic Arts	D(4y)																	VD	V	V		BM					
Theatre Production & Design Arts				D					D		D							C	D								
Audio and/or Visual Communications	D(4y)			D				D(3y) 3t									V		VD		BM						
Printing & Graphic Arts																		VC	VD						VC		

CODES:

B	Bachelor's Degree	D	Diploma (2 years)	w	weeks
M	Master's Degree	V	Varies	m	months
Ph.D	Doctoral Degree	1t	One-year transfer	y	years
C	Certificate (1 year or less)	2t	Two-year transfer		

*Information adapted from "It's About Time: To Start Thinking About Your Future," Advanced Education and Career Development, 1995.

BEST COPY AVAILABLE

DESIGN STUDIES

SECTION I: LEARNING RESOURCE GUIDE

This section of the GSI has been designed to provide a list of resources that support student learning.

Three types of resources are identified:

- Authorized: Resources authorized by Alberta Education for CTS curriculum; these resources are categorized as basic, support, or teaching
- Other: Titles provided as a service to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a preliminary review of these resources, but further review will be necessary prior to use in school jurisdictions
- Additional: A list of local, provincial and national sources of information available to teachers, including the community, government, industry, and professional agencies and organizations.

The information contained in this Guide, although as complete and accurate as possible as of June 1997, is time-sensitive.

For the most up-to-date information on learning resources and newer editions/versions, consult the LRDC *Buyers Guide* and/or the agencies listed in the Distributor Directory at the end of this section.

CTS is on the Internet.
Internet Address:
http://ednet.edc.gov.ab.ca

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INTRODUCTION

CTS AND THE RESOURCE-BASED CLASSROOM

Career and Technology Studies (CTS) encourages teachers to establish a resource-based classroom, where a variety of appropriate, up-to-date print and nonprint resources are available. Learning resources identified for CTS strands include print, software, video and CD-ROM formats. Also of significance and identified as appropriate throughout each strand are sources of information available through the Internet.

The resource-based classroom approach accommodates a variety of instructional strategies and teaching styles, and supports individual or small group planning. It provides students with opportunities to interact with a wide range of information sources in a variety of learning situations. Students in CTS are encouraged to take an active role in managing their own learning. Ready access to a strong resource base enables students to learn to screen and use information appropriately, to solve problems, to meet specific classroom and learning needs, and to develop competency in reading, writing, speaking, listening and viewing.

PURPOSE AND ORGANIZATION OF THIS DOCUMENT

The purpose of this document is to help teachers identify a variety of resources to meet their needs and those of the students taking the new CTS curriculum. It is hoped that this practical guide to resources will help teachers develop a useful, accessible resource centre that will encourage students to become independent, creative thinkers.

This document is organized as follows:

- Authorized Resources:
    - – basic learning resources
    - – support learning resources
    - – teaching resources
- Other Resources
- Additional Sources.
- Distributor Directory.

Some resources in the guide have been authorized for use in some or all of the CTS strands, e.g., the Career and Technology Studies video series produced by ACCESS: The Education Station. Further information is provided in relevant sections of this resource guide.

Each resource in the guide provides bibliographic information, an annotation where appropriate, and a module correlation to the CTS modules. The distributor code for each entry will facilitate ordering resources. It is recommended that teachers preview all resources before purchasing, or purchase one copy for their reference and additional copies as required.

Distributor Code	Resources		Levels/Mod. No.		
			1	2	3
ACC	Title	Author	1010	2010	3010
	Bibliographic Information				
	Annotation				

Distributor Code - see Distributor Directory

1 = Introductory
2 = Intermediate
3 = Advanced
Indicates module number

HOW TO ORDER

Most authorized resources are available from the Learning Resources Distributing Centre (LRDC) at:

12360 – 142 Street
Edmonton, AB T5L 4X9
Telephone: 403–427–5775 (outside of Edmonton dial 310–0000 to be connected toll free)
Fax: 403–422–9750
Internet: http://ednet.edc.gov.ab.ca/lrdc

Please check LRDC for availability of videos.

RESOURCE POLICY

Alberta Education withdraws learning and teaching resources from the provincial list of approved materials for a variety of reasons; e.g., the resource is out of print; a new edition has been published; the program has been revised. Under section 44 (2) of the *School Act*, school boards may approve materials for their schools, including resources that are withdrawn from the provincial list. **Many school boards have delegated this power to approve resources to school staff or other board employees under section 45 (1) of the *School Act*.**

For further information on resource policy and definitions, refer to the *Student Learning Resources Policy* and *Teaching Resources Policy* or contact:

Learning Resources Unit, Curriculum Standards Branch
Alberta Education
5th Floor, Devonian Building, East Tower
11160 Jasper Avenue
Edmonton, AB T5K 0L2
Telephone: 403–422–4872 (outside of Edmonton dial 310–0000 to be connected toll free)
Fax: 403–422–0576
Internet: http://ednet.edc.gov.ab.ca

Note: Owing to the frequent revisions of computer software and their specificity to particular computer systems, newer versions may not be included in this guide. However, schools may contact the LRDC directly at 403–427–5775 for assistance in purchasing computer software.

Trademark Notices: Microsoft, Access, Excel, FoxPro, Mail, MS-DOS, Office, PowerPoint, Project, Publisher, Visual Basic, Visual C++, Windows, Windows NT, Word, and Works are either registered trademarks or trademarks of Microsoft Corporation. Apple, Mac, Macintosh, and Power Macintosh are either registered trademarks or trademarks of Apple Computer, Inc. Other brand and product names are registered trademarks or trademarks of their respective holders.

AUTHORIZED RESOURCES

BASIC LEARNING RESOURCES

The following basic learning resources have been authorized by Alberta Education for the use in the Design Studies curriculum. These resources address the majority of the learner expectations in one or more modules and/or levels. A curriculum correlation appears in the right-hand column.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Architecture: Drafting and Design.* (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. This comprehensive drafting text provides a wealth of information for the person engaged in drafting. Teacher's manual and workbook are available. Note: Uses primarily imperial measurement.	1010 1050 1060	2040 2050	3070 3080 3110 to 3180
LRDC	*Architecture: Residential Drawing and Design.* Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1995. Excellent introductory resource for architectural design and drafting. It covers types of designs, floor plans and planning, electrical, plumbing, heating, landscaping and building codes and specifications. Instructor's manual and workbook are available. Note: Uses primarily imperial measurement.	1050 1060	2030 2040 2050 2060	3070 to 3160 3180
LRDC	*Ashlar Vellum 3D.* (Macintosh Version 2.7.) Sunnyvale, CA: Ashlar Inc., 1993. Ashlar Vellum 3D is a computer-assisted design package developed with the designer in mind. While straightforward in its approach, it is a powerful tool providing features required by most architects and engineers. Its features make it intuitive, allowing users to progress through a design logically and creatively. It is an excellent tool for Design Studies.	1050 1060	2030 2040 2050	3100 to 3160
LRDC	*AUTOCAD.* (Macintosh Release R12 and Windows Release R12.) Autodesk Inc./Merlan Scientific Ltd. AutoCAD is a 2D/3D technical drawing and drafting software package for intermediate and advanced level courses.		2030 2040 2050	3100 to 3160

Basic Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Design and Communication: Collins CDT.* K. Crampton, M. Finney and A. Breckon (editors). Hammersmith, London: Collins Educational, 1988. This British resource covers all areas of graphic communication and provides excellent basic information in the more technical, drawing and design areas. Chapters include skills in drawing, engineering drawing and environmental drawing.	1010 1020 1030 1060	2010 2040 2050	3010 3020 3030 3110 to 3160
LRDC	*Design and Problem Solving in Technology.* John Hutchinson and John Karsnitz. Delmar Publishers Inc. ITP Nelson Canada, 1994. This book is intended to help students develop their ability to think creatively and critically; to apply knowledge to real-world situations; to develop the ability to express, refine and evaluate creative ideas through the design/problem-solving process; and to develop a world-view of technology as it relates to the individual, society and the environment.	1010 1020 1030 1040 1060	2010 2020 2040	3010 to 3090 3180
LRDC	*Design and Realisation: Collins CDT.* C. Chapman, M. Peace and A. Breckon (editors). Hammersmith, London: Collins Educational, 1988. This British resource concentrates on 3D design, offering skills and techniques, materials, basic technology (e.g., control systems, structures) manufacturing technologies and product design.	1020 1040	2020 2040 2050 2060	3040 3050 3060 3190
LRDC	*Design Graphics: Drawing and Presenting Your Design Ideas.* David Fair and Marilyn Kenny. London: Hodder and Stoughton, 1987. This resource covers most of the basics for a beginning designer. It is an easily accessible resource providing instruction and examples of design techniques and methods with particular emphasis on drawing, illustration and rendering.	1010 1020 1030 1040 1060	2010 2020 2040	3010 3020 3040 3050 3110 3120 3190
LRDC	*Exploring Drafting: Fundamentals of Technology.* John R. Walker. South Holland, IL: Goodheart-Willcox Co. Inc., 1996. This is a comprehensive resource for students learning basic drafting. It covers techniques, terminology and application, and includes clear, concise descriptions with supporting illustrations. Solution manual and worksheets are available to accompany the text.	1010 1030 1050 1060	2010 2030 2040 2050	3100 to 3160

Basic Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Interior Design Illustrated.* Francis D.K. Ching. New York, NY: Van Nostrand Reinhold, 1987. The purpose of this primer is to introduce to students of interior design those fundamental elements that make up our interior environments. It outlines the characteristics of each element and presents the choices we have in selecting and arranging them into design patterns. In making these choices, emphasis is placed on basic design principles and how design relationships determine the functional, structural and aesthetic qualities of interior spaces.	1010 1020 1030 1040 1060	2010 2020 2040	3040 to 3090 3110 3120 3130
LRDC	*Introduction to Design and Technology.* R. Todd, et al. Thompson Learning Tools, 1996. The text is designed to teach high school students technology education by focusing on the design process, resource systems and impact on technology. It has excellent links to science through scientific principles. The computer disk provides immediate access to a wide variety of design briefs that can be tailored to individual or group settings or as a teaching master. Each brief is related directly to the text material. Teacher's resource guide, portfolio and activities resource, design brief manager software (MS-DOS and MAC version) are available.	1010 1020 1030 1040	2010 2020 2060	3170 3180
LRDC	*MiniCad.* (Macintosh Version 5.) PaXar Technologies. Courseware. An excellent CAD drawing package usable for all levels of designers from introductory/student learner to the professional working in the design industry. Excellent drawing features with a comprehensive drawing window, menu bar and tool palettes. Dialog boxes are very helpful. 2D and 3D capabilities are a great help for visualization and presentation of design drawings.	1050 1060	2030 2040 2050	3100 to 3160
LRDC	*Technical Drawings: General Principles: CSA Standard B781M83.* Canadian Standards Association, 1996. This standard specifies the general principles of presentation to be applied to all kinds of technical drawings (mechanical, electrical, civil engineering, architectural, etc.).	1050 1060	2030 2040 2050	

SUPPORT LEARNING RESOURCES

The following support learning resources are authorized by Alberta Education to assist in addressing some of the learner expectations of a module or components of modules.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Architectural and Interior Design* (Video includes Teacher's Notes). Classroom Video, 1988. This video goes into an architect's office to examine the processes involved in tackling a design task: client's requirements, anthropometries and ergonomics, effect of different layouts, corporate image, codes and zoning, costs and impacts, and achieving efficiency in the design process.			3070 3080 3090 3180
LRDC	*Architecture: Drafting and Design.* (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. Workbook. See Basic Learning Resources for annotation and module correlation.			
LRDC	*Architecture: Residential Drawing and Design.* Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1995. Workbook. See Basic Learning Resources for annotation and module correlation.			
ACC	*Career and Technology Studies: Key Concepts.* Edmonton, AB: ACCESS: The Education Station. A series of videos and utilization guides relevant to all CTS strands. The series consists of: *Anatomy of a Plan; Creativity; Electronic Communication; The Ethics Jungle; Go Figure; Innovation; Making Ethical Decisions; Portfolios; Project Planning; Responsibility* and *Technical Writing*.	all	all	all
LRDC	*ClarisDraw™* (Macintosh/Power Macintosh , Version 1.0). Claris Corporation, 1994. ClarisDraw is a MacDraw software that integrates drawing, advanced text handling, painting, image editing, and presentations with revolutionary graphics and intelligence.	1020 1030 1040	2010	3010 3020 3030
LRDC	*Communicating Design.* Design and Technology in Action Series. Tom Baird. Oxford: Heinemann Educational, 1990. This British resource emphasizes communication through basic drawing techniques, and specifics to do with the use of colour, graphics, modelling and geometric constructions as they are applied in design.	1010 1020 1030	2010	3010 3020 3030 3130

Support Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Concepts of Technical Graphics.* J.M. Duffy. PWS-Kent Publishing, 1990. This text is aimed at helping students understand the fundamental theory of technical graphics. It focuses on the concepts of the area rather than manual or computer-assisted techniques. In this way the illustrations and documentation can be applied through any methodology. Geometric principles, as they apply to technical drawing, are stressed in this resource.	1060	2040 2050	3110 3120 3130 3140 3150 3160
LRDC	*D & T Challenges.* Royal College of Art Schools Technology Project. Hodder & Stoughton Educational, 1995. Student Book 1 and Student Book 2. Consists of two student books with teacher's resources and course guide for KS3 for each colour group. Package is drawn together and set in context by the course guide, which provides an overview course. The texts are divided into a series of coherent learning units or challenges. Each designing and making activity is set in context, reinforced industrial case studies and supported by a number of carefully selected focused practical tasks. Note: The resources follow the British Design and Technology program for ages 11-14. The terminology and examples used reflect the British context.	1020 1030 1040		
LRDC	*Design and Drawing: An Applied Approach.* Richard L. Shadrin. Worchester: Davis Publications, Inc., 1992. This is a good introductory resource providing basic information on a wide variety of design areas. Biographies of famous designers highlighting their life and work are presented.	1010 1020 1030 1040	2010 2020 2040 2060	3170 3190
LRDC	*Design and Technology.* Colin Caborn, Ian Mould and John Cave. Walton Thames: Thomas Nelson and Sons, 1989. Provides teachers and students with a wealth of information and techniques to do with materials, tools, processes, mechanisms and control devices, electronics, structures, energy and communication. These are covered in some depth. An instructor's guide is available.	1010 1020 1030 1040 1060	2010 2020	3040 3050 3060 3110 3120 3130
LRDC	*Design Dialogue.* Jack Stoops and Jerry Samuelson. Worchester: Davis Publications, Inc., 1990. Focuses on functional design as aesthetic solutions to visual problems in daily life. Text discusses the role of perception and imagination in the design process. A section is included on major designers and design movements. The design projects given are referenced to and follow the sequencing of the text.	1010 1020 1030 1040	2010 2020 2060	3010 3020 3030

Support Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Designing Interiors*. Rosemary Kilmer and Otie W. Kilmer. Orlando, FL: Harcourt Brace, Jovanovich, 1992. A comprehensive overview of the knowledge required by the interior designer. Presents interior design as an integrated process applicable to residential and commercial interiors. The text follows the design process from problem awareness to incorporating various materials and building systems to create interior spaces. Instructor's guide is available.	1020	2020 2040 2060	3040 to 3090 3110 3120 3130 3180
LRDC	*Designing Toys*. (Video includes Teacher's Notes). Classroom Video, 1996. Filmed in Australia, Britain and Canada, this video provides an informative and entertaining account of how toys are designed, manufactured and marketed. Toys featured include a toy oven, a model running car, bath toys, puppets and simple wooden toys. Designers and manufacturers discuss how they manage the process from design brief through prototype testing, modification and marketing.	1020	2020	3040 3050 3060 3180
CLV	*Design Project, A: Case Study: Four Responses to a Design Brief*. Classroom Video, 1993. Video. The Museum of Contemporary Art in Sydney, Australia held an exhibition called Caravan, a term used to describe what a Canadian would call a holiday trailer. Four designs were developed by different design production teams. The video records the development of each from brief statement through concept development, prototype design to building, display and evaluation. This cycle provides an excellent illustration of design as a process.	1020 1040	2020	3040 to 3090 3170
LRDC	*Experience Technology: Manufacturing, Construction*. H. Harms, et al. Glencoe/McGraw-Hill, 1997. Text and Workbook. This activity-oriented resource introduces middle and junior high school students to production technology. Its innovative format motivates students to read about manufacturing and construction. Each section begins with a challenging problem-solving activity that motivates students to use the textbook content as an information resource to help them complete the activity. A teacher's annotated edition and workbook are available.	1020 1030 1040	2020	3040 3050 3060 3070 3080 3090 3180
LRDC	*Exploring Drafting: Fundamentals of Technology*. John R. Walker. South Holland, IL: Goodheart-Willcox Co. Inc., 1996. Worksheets. See Basic Learning Resources for annotation and module correlation.			

Support Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Foundations of Graphic Design.* Kevin Gatta, Gusty Lange and Marilyn Lyons. Worchester: Davis Publications, Inc., 1991. A comprehensive student resource for the graphic design area, this text covers tools, materials and techniques from concept to press. It also has many good design examples and biographies of well-known designers.	1010 1020 1030	2010 2060	3010 3020 3030 3180
VEC	*Future Habitats* (Futures 2 Series). Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992. *Future Habitats* is a 15-minute program that demonstrates the relationship between mathematics and the design of structures for human habitation. Emphasis is placed on space habitation and some of the considerations scientists/designers/engineers must deal with. Jaime Escalante hosts with Leonard Nemoy as special guest.		2020 2030 2040	3070 to 3130 3170 3180
VEC	*Graphic Design* (Futures 2 Series). Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992. *Graphic Design* is a 15-minute program that shows students how the graphic design profession offers them practical applications of mathematics in advertising, entertainment and communication. Introduces students to seven distinct graphic fields. Examples are drawn from USA Today, MTV and other workplaces where students observe this fast-paced career in action. Jaime Escalante and graphic designer Roland Young demonstrate the role of symmetry in creating a design.	1010 1020 1030	2010 2030	3010 3020 3030 3050 3070 to 3100 3120 3170 3180
LRDC	*Graphic Products* (Design & Make It!) T. Shephard and A. Loft. Stanley Thornes Publishers Ltd., 1996. This text is highly illustrated and in full colour. Contains a mixture of extended projects, focused tasks and investigate, disassemble and evaluate activities. Design projects include designing and making the poster and merchandising for a new movie, designing the casing and graphics for a new electronic pager and more.	1020 1030 1060	2010 2020	
LRDC	*Ideas on Design.* Stuart McDonald. Hodder & Stoughton Educational, 1989. This resource has developed 25 different design briefs appropriate for introductory and intermediate level design. They are presented in a loose leaf format on card stock for easy accessibility and durability. A series of resource sheets including the design process, evaluation, generating ideas, terminology and techniques are provided.	1020 1030 1040	2010 2020	

Support Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
VEC	*Industrial Design.* (Futures 2 Series.) Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992. *Industrial Design* is a 15-minute program that demonstrates how mathematics is used by industrial designers as they develop new products for consumers. Jaime Escalante hosts the program and Syd Mead, industrial designer, is his guest.	1010 1020 1040	2020	3040 to 3100 3170 3180
LRDC	*Introduction to Design and Technology: Design Brief Manager Software.* (MS/DOS Version and Macintosh Version.) D. Engstrom and L. Hatch. Thompson Learning Tools, 1996. Software. See Basic Learning Resources for annotation and module correlation.			
LRDC	*Photography.* B. London and J. Upton. Harper Collins College Publishers, 1994. This beautifully illustrated book covers material for basic photography through advanced levels. It is very comprehensive including "how to" information and excellent examples specific to context or concepts. A troubleshooting section is provided as well as a comprehensive history of photography.	1030	2010	3010 3020 3030 3180 3190
LRDC	*Real Design Real Activities.* J. Ridgwell. Hodder & Stoughton Educational, 1992. Consists of a colourful and exciting text backed up by a resource pack. Contents of the text include design for sport, new product design, design in motion and design for the world. Design across cultures is explored and cross-curricular reference grid provided. Resource pack is available.	1020 1040		
LRDC	*Structures with Materials.* (GCSE Technology.) S. Rich, Stanley Thornes (Publishers) Ltd., 1991. Applies a problem-solving approach to the "harder" end of technology. Activities are designed for both individual and group settings. Note: Teachers please note that a potential community concern may exist regarding the topic of evolution (page 32).	1020 1040	2020	

Support Learning Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Technology Systems.* T.R. Wright. The Goodheart-Willcox Company, Inc., 1996. Text and Student Activity Manual. This text is designed for use in high school technology education courses. Study is grouped into the four clusters: manufacturing, construction, communication and transportation. Content covers how technological systems work and their effect on people and the planet. An instructor's manual is available.	1020 1030 1040 1060	2010 2020	3010 to 3060 3180
LRDC	*Technology: Today & Tomorrow.* (3rd edition.) J. Fales and V. Kuetemeyer, et al. Glencoe/McGraw-Hill, 1997. Text and Student Workbook. This resource deals with five important areas of technology – communication, manufacturing, transportation, construction and biotechnology. In addition, the problem-solving process is defined, parts of a technological system are explained and curricular and cross-curricular activities are provided. Imperial measurements are used throughout this resource. Teacher's annotated edition, teacher's resource binder, making connections and media correlations are available.	1020 1030 1040 1060		
LRDC	*Visual Design: Elements & Principles.* (Video includes Teacher's Notes). Classroom Video, 1989. Good design is the aesthetic/visual organization and structure of abstract elements into an arrangement, pattern, or composition. Design is governed by First Order Principles, which prescribe inherent or fundamental relationships that are applied to coordinate the forces of the inherent relationships to achieve the ultimate Third Order Principles, which affect our sense of aesthetic beauty. This video illustrates elements and principles of design and their interrelationships.	1020	2010 2020	3010 3040 3080

TEACHING RESOURCES

The following teaching resources are authorized by Alberta Education to assist teachers in the instructional process.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Advanced Technical Drawing.* (Video includes Teacher's Notes). Classroom Video, 1988. This video illustrates specific technical drawing methods including basic drawing systems, reference envelopes, circles in paraline and perspective, preparing technical drawings, traditional perspective (1 and 2 point), measuring point perspective and drawing complex objects such as cars and cameras. The teacher's notes list each content component and are time coded for easy access.	1060	2040 2050	3110 3120 3130 3140 3150 3160
LRDC	*Architecture: Drafting and Design.* (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. Teacher's Manual. See Basic Learning Resources for annotation and module correlation.			
LRDC	*Architecture: Residential Drawing and Design.* Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1995. Instructor's Manual. See Basic Learning Resources for annotation and module correlation.			
LRDC	*Basic Visual Concepts and Principles for Artists, Architects, and Designers.* Charles Wallschlaeger and Cynthia Busic-Snyder. Dubuque, IA: Wm. C. Brown Publishers, 1992. Centres on a process-oriented approach to learning the theories, concepts and skills used in creating form. The notion of process is emphasized as it is applied in many design fields. The theoretical constructs are supported by practical problems with sample solutions, appropriate definitions and a substantial bibliography specific to each topic covered.	1010 1020 1030 1040	2010 2020 2040 2060	3010 to 3090
LRDC	*D & T Challenges.* Royal College of Art Schools Technology Project. Hodder & Stoughton Educational, 1995. Teacher's Resource Book 1, Teacher's Resource Book 2 and Course Guide for KS3. See Support Learning Resources for annotation and module correlation.			

Teaching Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Design and Technology*. Colin Caborn, Ian Mould and John Cave. Walton Thames: Thomas Nelson and Sons, 1989. Instructor's Guide. See Support Learning Resources for annotation and module correlation.			
LRDC	*Designing Interiors*. Rosemary Kilmer and Otie W. Kilmer. Orlando, FL: Harcourt, Brace, Jovanovich, 1992. Instructor's Guide. See Support Learning Resources for annotation and module correlation.			
LRDC	*Experience Technology: Manufacturing, Construction*. H. Harms; et al. Glencoe/McGraw-Hill, 1997. Teacher's Annotated Edition. See Support Learning Resources for annotation and module correlation.			
LRDC	*Exploring Drafting: Fundamentals of Technology*. John R. Walker. South Holland, IL: The Goodheart-Willcox Company, Inc., 1996. Solution Manual to accompany student text and worksheets. See Basic Learning Resources for annotation and module correlation.			
LRDC	*Graphic Design Basics*. (2nd edition.) Amy E. Arntson. Fort Worth, TX: Harcourt, Brace, Jovanovich College Publishers, 1993. This excellent teaching resource provides a solid design philosophy and some good ideas for student work. It covers all aspects of graphic design very well. This is a well-designed, attractive resource written at a introductory college or university level.	1010 1020 1030	2010 2060	3010 3020 3030
LRDC	*Introduction to Design and Technology*. D. Engstrom and L. Hatch. Thompson Learning Tools, 1996. Teacher's Resource Guide and Portfolio and Activities Resource. See Basic Learning Resources for annotation and module correlation.			

Teaching Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	*Rapid Viz: A New Method for the Rapid Visualization of Ideas.* Kurt Hanks and Larry Belliston. Menlo Park, CA: Crisp Publications, 1990. *Rapid Viz* is a drawing book for designers who want to get their ideas down quickly and effectively, and need the skills to do so. The book is full of ideas and examples and includes a wide variety of subject matter. Teachers will find this a useful tool in their drawing/design class.	1010 1030 1040	2010 2020 2040	3010 to 3090 3110 3120 3130
LRDC	*Real Design Real Activities.* J. Ridgwell. Hodder & Stoughton Educational, 1992. Resource Pack. See Support Learning Resources for annotation and module correlation.			
LRDC	*Technical Graphics.* (Video includes Teacher's Notes.) Classroom Video, 1986. Everyone draws or is involved in drawing. Whether it be reading maps, road signs, plans of homes or technical information, communication by graphics is an important part of our technology society. Demands of industry require illustrators to draw quickly and to present consumers and clients with drawings that are realistic. This video provides techniques in perspective drawing and rendering. It is time coded for easy access to specific areas of interest.	1030 1060	2040 2050	3110 to 3160
LRDC	*Technology Systems.* T.R. Wright. The Goodheart-Willcox Company, Inc., 1996. Instructor's Manual. See Support Learning Resources for annotation and module correlation.			
LRDC	*Technology: Today & Tomorrow.* (3rd edition.) J. Fales and V. Kuetemeyer, et al. Glencoe/McGraw-Hill, 1997. Teacher's Annotated Edition; Teacher's Resource Binder (Note: Authors are Haller, C. & Thompson, E.); Making Connections; Media Correlations. See Support Learning Resources for annotation and module correlation.			
LRDC	*Way Things Work, The: Teacher's Pack* (Windows Version and Macintosh Version.) D. Macaulay. Irwin Publishing, 1996. CD-ROM/Teacher's Pack Binder. This multimedia resource provides 200 inventions that come to life through student interaction. It includes over 1500 screens and pop-up windows. Teacher's pack includes teacher's notes and 25 blackline masters. Available for Macintosh and Windows environments.	1020 1040	2060	

DESIGN STUDIES RESOURCES

THEME CODE:
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

FORMAT CODE:
p - Print
v - Video
s - Software

STATUS CODE:
B - Basic
S - Support
T - Teaching
O - Other

LEVEL CODE:
1 - Introductory
2 - Intermediate
3 - Advanced

JR/SR HIGH CODE:
J - Junior High
S - Senior High

	Format	*Status*	*Junior/Senior High*	Sketch, Draw & Model	The Design Process	2-D Design Fundamentals	3-D Design Fundamentals	CAD Fundamentals	Drafting/Design Fund.	2-D Design Applications	3-D Design Applications	CAD Applications	Drafting/Design App.	Technical Drawing App.	The Evolution of Design	2-D Design Studio1	2-D Design Studio 2	2-D Design Studio 3	3-D Design Studio 1	3-D Design Studio 2	3-D Design Studio 3	Living Environ. Studio 1	Living Environ. Studio 2	Living Environ. Studio 3	CAD Modelling Studio	Drafting/Design Studio 1	Drafting/Design Studio 2	Drafting/Design Studio 3	Tech. Drawing Studio 1	Tech. Drawing Studio 2	Tech. Drawing Studio 3	Visualizing the Future	The Design Profession	Portfolio Presentation
LEVEL				1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME				A	A	A	A	B	B	A	A	B	B	B	B	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
Module Numbers				1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190
Architecture: Drafting & Design (6th Ed.)				X				X	X				X	X								X	X			X	X	X	X	X	X	X	X	
Text	*p*	B	J/S																															
Workbook	*p*	S	J/S																															
Teacher's Manual	*p*	T	J/S																															
Architecture: Residential Drawing & Design								X	X			X	X	X	X							X	X	X	X	X	X	X	X	X	X		X	
Text	*p*	B	J/S																															
Workbook	*p*	S	J/S																															
Instructor's Manual	*p*	T	J/S																															
Basic Visual Concepts and Principles for Artists, Architects and Designers	*p*	T	J/S	X	X	X	X			X	X		X		X	X	X	X	X	X	X	X	X	X										
Communicating Design	*p*	S	J/S	X	X	X				X						X	X	X										X						
Concepts of Technical Graphics	*p*	S							X				X	X												X	X	X	X	X	X			
D & T Challenges					X	X	X																											
Student Book 1 & 2	*p*	S	J																															
Teacher's Resource Book 1 & 2	*p*	T	J																															
Course Guide for KS3	*p*	T	J																															
Design and Communication: Collins CDT	*p*	B	J/S	X	X	X			X	X			X	X		X	X	X								X	X	X	X	X	X			
Design and Drawing: An Applied Approach	*p*	S	J/S	X	X	X	X			X	X		X		X																	X		X
Design and Problem Solving in Technology	*p*	B	J/S	X	X	X	X		X	X	X		X			X	X	X	X	X	X	X	X	X									X	
Design and Realisation: Collins CDT	*p*	B	J/S		X		X				X		X	X	X				X	X	X													X
Design and Technology				X	X	X	X		X	X	X								X	X	X					X	X	X						
Text	*p*	S	J/S																															
Instructor's Guide	*p*	T	J/S																															
Design Dialogue	*p*	S	J/S	X	X	X	X			X	X				X	X	X	X																

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DESIGN STUDIES RESOURCES

THEME CODE:
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

FORMAT CODE:
p - Print
v - Video
s - Software

STATUS CODE:
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T - Teaching
O - Other

LEVEL CODE:
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JR/SR HIGH CODE:
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Module Numbers	*Format*	*Status*	*Junior/Senior High*	1010 Sketch, Draw & Model	1020 The Design Process	1030 2-D Design Fundamentals	1040 3-D Design Fundamentals	1050 CAD Fundamentals	1060 Drafting/Design Fund.	2010 2-D Design Applications	2020 3-D Design Applications	2030 CAD Applications	2040 Drafting/Design App.	2050 Technical Drawing App.	2060 The Evolution of Design	3010 2-D Design Studio1	3020 2-D Design Studio 2	3030 2-D Design Studio 3	3040 3-D Design Studio 1	3050 3-D Design Studio 2	3060 3-D Design Studio 3	3070 Living Environ. Studio 1	3080 Living Environ. Studio 2	3090 Living Environ. Studio 3	3100 CAD Modelling Studio	3110 Drafting/Design Studio 1	3120 Drafting/Design Studio 2	3130 Drafting/Design Studio 3	3140 Tech. Drawing Studio 1	3150 Tech. Drawing Studio 2	3160 Tech. Drawing Studio 3	3170 Visualizing the Future	3180 The Design Profession	3190 Portfolio Presentation
LEVEL				1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME				A	A	A	A	B	B	A	A	B	B	B	B	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
Design Graphics: Drawing and Presenting Your Design Ideas	p	B	J/S	X	X	X	X		X	X	X		X			X	X		X	X						X	X							X
Designing Interiors					X						X		X		X				X	X	X	X	X	X		X	X	X					X	
Text	p	S	J/S																															
Instructor's Guide	p	T	J/S																															
Experience Technology: Manufacturing, Construction					X	X	X				X								X	X	X	X	X	X									X	
Text & Workbook	p	S	J/S																															
Teacher's Annotated Edition	p	T	J/S																															
Exploring Drafting: Fundamentals of Technology				X		X		X	X	X		X	X	X											X	X	X	X	X	X	X			
Text	p	B	J/S																															
Work Sheets	p	S	J/S																															
Solution Manual	p	T	J/S																															
Foundations of Graphic Design	p	S	S	X	X	X				X					X	X	X	X															X	
Graphic Design Basics (2nd Ed.)	p	T	J/S	X	X	X				X					X	X	X	X																
Graphic Products (Design & Make It!)	p	S	J/S		X	X			X	X	X																							
Ideas on Design	p	S	J/S		X	X	X			X	X																							
Interior Design Illustrated	p	B	J/S	X	X	X	X		X	X	X		X						X	X	X	X	X	X		X	X	X						
Introduction to Design and Technology				X	X	X	X			X	X				X																	X	X	
Text	p	B	J/S																															
Design Brief Manager Software	s	S	J/S																															
Teacher's Resource Guide	p	T	J/S																															
Teacher's Portfolio	p	T	J/S																															
Teacher's Activities Resource	p	T	J/S																															

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LEVEL				1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME				A	A	A	A	B	B	A	A	B	B	B	B	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
Module Numbers				1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190
Photography	*p*	S	J/S			X				X						X	X	X															X	X
Rapid Viz: A New Method for the Rapid Visualization of Ideas	*p*	T	J/S	X		X	X			X	X		X			X	X	X	X	X	X	X	X	X		X	X	X						
Real Design Real Activities					X		X																											
Text	*p*	S	J																															
Resource Pack	*p*	T	J																															
Structures With Materials - GCSE Technology	*p*	S	J/S		X		X				X																							
Technical Drawings: General Principles	*p*	B	J/S					X	X			X	X	X																				
Technology Systems					X	X	X		X	X	X					X	X	X	X	X	X												X	
Text & Student Activity Manual	*p*	S	J/S																															
Instructor's Manual	*p*	T	J/S																															
Technology: Today & Tomorrow					X	X	X		X																									
Text & Student Workbook	*p*	S	J																															
Teacher's Annotated Edition	*p*	T	J																															
Teacher's Resource Binder	*p*	T	J																															
Making Connections	*p*	T	J																															
Media Correlations	*p*	T	J																															
VIDEO RESOURCES																																		
Advanced Technical Drawing	*v*	T	J/S						X				X	X												X	X	X	X	X	X			
Architectural and Interior Design	*v*	S	S																			X	X	X									X	
Career and Technology Studies: Key Concepts	*v*	S	J/S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Design Project, A: Case Study: Four Responses to a Design Brief	*v*	S	J/S		X		X				X								X	X	X	X	X	X								X		
Designing Toys (includes Teacher's Notes)	*v*	S	J/S		X						X								X	X	X												X	

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THEME				A	A	A	A	B	B	A	A	B	B	B	B	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
	Format	*Status*	*Junior/Senior High*	Sketch, Draw & Model	The Design Process	2-D Design Fundamentals	3-D Design Fundamentals	CAD Fundamentals	Drafting/Design Fund.	2-D Design Applications	3-D Design Applications	CAD Applications	Drafting/Design App.	Technical Drawing App.	The Evolution of Design	2-D Design Studio1	2-D Design Studio 2	2-D Design Studio 3	3-D Design Studio 1	3-D Design Studio 2	3-D Design Studio 3	Living Environ. Studio 1	Living Environ. Studio 2	Living Environ. Studio 3	CAD Modelling Studio	Drafting/Design Studio 1	Drafting/Design Studio 2	Drafting/Design Studio 3	Tech. Drawing Studio 1	Tech. Drawing Studio 2	Tech. Drawing Studio 3	Visualizing the Future	The Design Profession	Portfolio Presentation
Module Numbers				1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190
Future Habitats (Futures 2 Series)	*v*	S	J/S								X	X	X									X	X	X	X	X	X	X				X	X	
Graphic Design (Futures 2 Series)	*v*	S	J/S	X	X	X				X		X				X	X	X		X		X	X	X	X		X					X	X	
Industrial Design (Futures 2 Series)	*v*	S	J/S	X	X		X				X								X	X	X	X	X	X	X							X	X	
Technical Graphics (Includes Teacher's notes)	*v*	T	J/S			X			X				X	X												X	X	X	X	X	X			
Visual Design: Elements & Principles	*v*	S	J/S		X					X	X					X			X				X											
SOFTWARE RESOURCES																																		
Ashlar Vellum 3D (Macintosh Version 2.7)	*s*	B	J/S					X	X			X	X	X											X	X	X	X	X	X	X			
Autocad Release (Mac. & Win. Release R12)	*s*	B	S									X	X	X											X	X	X	X	X	X	X			
ClarisDraw (Mac/Power Mac Ver. 1.0)	*s*	S	J/S		X	X	X			X						X	X	X																
Introduction to Design and Technology	*s*	S	J/S	X	X	X	X			X	X				X																	X	X	
MiniCad (Macintosh Version 5)	*s*	B	J/S					X	X			X	X	X											X	X	X	X	X	X	X			
Way Things Work, The: Teacher's Pack	*s*	T	J/S		X		X								X																			
OTHER RESOURCES																																		
Art and Design Series: Drawing; Drawing and Painting; Graphics; and Photography	*p*	O	J/S	X		X				X						X																		
Design and Technology	*p*	O	J		X	X	X																											
Designing: Exploring Secondary Design and Technology	*p*	O	J/S	X	X	X	X			X	X				X	X	X	X	X	X	X	X	X	X								X	X	X
Discovering the Future: The business of Paradigms	*p*	O			X										X																	X	X	
Drawing: A Complete Course	*p*	O	J/S	X		X				X																								
Technical Drawing (3rd Ed.)								X				X		X											X				X	X	X			
Text	*p*	O	J/S																															
Workbook	*p*	O	S																															
Instructor's Guide	*p*	O	S																															

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OTHER RESOURCES

These titles are provided as a service only to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a preliminary review of the resources. However, the responsibility to evaluate these resources prior to selection rests with the user, in accordance with any existing local policy.

Distributor Code	Other Resources	Levels/Module No.		
		1	2	3
BH	*Art and Design Series: Drawing; Drawing and Painting; Graphics; and Photography.* Hodder & Stoughton Educational. Bacon and Hughes, 1995. Illustrated in colour with carefully selected works by major artists and examples of student work. Good for generating ideas but does not provide specific instruction.	1010 1030	2010	3010
OUP	*Design and Technology.* C. Bradley, et.al. Oxford University Press Australia, 1996. This textbook aims to explain the principles of design and technology. Part 1 provides reference material to help understand how to complete a design brief. Part 2 provides information relating to real-life concerns and interests, demonstrates how to apply the design process in order to work out and solve design briefs. There are also activities which help to extend knowledge and understanding of ethical issues.	1020 1030 1040		
GW	*Designing: Exploring Secondary Design and Technology.* Gillard Welch. *Designing* is a magazine for secondary students and teachers working in any design-related field. Published six times per year by Gillard Welch, *Designing* covers the gamut of design work with each issue concentrating on a variety of themes (e.g., product design, clothing design, bicycle design, magazine design). This colourful publication offers many good ideas.	1010 1020 1030 1040	2010 2020 2060	3010 to 3090 3170 3180 3190
ITE	*Discovering the Future: The Business of Paradigms.* (2nd edition.) Joel Barker. Toronto, ON: Kinetic, Video with discussion guide, 1990. "Paradigms" are rules we take for granted - the most basic assumptions about how we live and work. Joel Barker's "Going Back to Zero" rule reveals how industry giants and newcomers to a field start as equals when paradigms shift.	1020	2060	3170 3180

Other Resources (Continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
KIN	*Drawing: A Complete Course.* Lucy Davidson-Rosenfeld. J. Weston Walch Publisher. Kinetic Inc., 1987. The worktext explains and shows the basic concepts of space, composition, media and design. The 10 chapters include 111 examples of drawings and 84 illustrations that guide the students through the drawing exercises. This resource will assist teachers interested in basic drawing techniques.	1010 1030	2010	
NEL	*Technical Drawing.* (3rd edition.) David L. Goetsch, John A. Nelson and William S. Chalk. New York, NY: Delmar Publishing Inc., 1994. Text; Workbook; Instructor's Guide. This comprehensive resource covers all aspects of the technical drafting field. It is a high level reference source most appropriate for teacher reference.	1050	2030 2050	3100 3140 3150 3160

ADDITIONAL SOURCES

Available to Career and Technology Studies (CTS) teachers, locally and provincially, are many sources of information that can be used to enhance CTS. These sources are available through the community (e.g., libraries, boards, committees, clubs, associations) and through government agencies, resource centres and organizations. Some sources, e.g., government departments, undergo frequent name and/or telephone number changes. Please consult your telephone directory or an appropriate government directory.

The following is a partial list of sources to consider:

TEACHER–LIBRARIANS

Planned and purposeful use of library resources helps students grow in their ability to gather, process and share information. Research activities require access to an adequate quantity and variety of appropriate, up-to-date print and nonprint resources from the school library, other libraries, the community and additional sources. Some techniques to consider are:

- planning together
- establishing specific objectives
- integrating research skills into planning.

Cooperation between the teacher-librarian and the subject area teacher in the development of effectively planned resource-based research activities ensures that students are taught the research skills as well as the subject content. Also see *Focus on Research: A Guide to Developing Student's Research Skills* referenced in the Alberta Education resources section.

ALBERTA EDUCATION SOURCES

Alberta Government telephone numbers can be reached toll free from outside Edmonton by dialing 310–0000.

The following monographs are available for purchase from the Learning Resources Distributing Centre. Refer to the Distributor Directory at the end of this section for address, telephone, fax and Internet address.

Please consult the "Support Documents" section or the "Legal, Service and Information Publications" section in the LRDC *Buyers Guide* for ordering information and costs.

Developmental Framework Documents

- *The Emerging Student: Relationships Among the Cognitive, Social and Physical Domains of Development,* 1991 (Stock No. 161555)

  This document examines the child, or student, as a productive learner, integrating all the domains of development: cognitive, social and physical. It emphasizes the need for providing balanced curriculum and instruction.

- *Students' Interactions Developmental Framework: The Social Sphere,* 1988 (Stock No. 161399)

  This document examines children's perceptual, structural and motor development and how such physical development affects certain learning processes.

- *Students' Physical Growth: Developmental Framework Physical Dimension,* 1988 (Stock No. 161414)

  This document examines children's normal physical growth in three areas: perceptual, structural and motor development. In none of these areas is the child's growth in a single continuous curve throughout the first two decades of life. Physical growth is characterized by periods of rapid growth and periods of slower growth. Consequently, differences and changes in growth patterns may affect the timing of certain learning processes.

Other

- *Focus on Research: A Guide to Developing Students' Research Skills,* 1990 (Stock No. 161802)

  This document outlines a resource-based research model that helps students manage information effectively and efficiently, and gain skills that are transferable to school and work situations. This model provides a developmental approach to teaching students how to do research.

- *Teaching Thinking: Enhancing Learning,* 1990 (Stock No. 161521)

  Principles and guidelines for cultivating thinking, ECS to Grade 12, have been developed in this resource. It offers a definition of thinking, describes nine basic principles on which the suggested practices are based, and discusses possible procedures for implementation in schools and classrooms.

ACCESS: The Education Station

ACCESS: The Education Station offers a variety of resources and services to teachers. For a nominal dubbing and tape fee, teachers may have ACCESS: The Education Station audio and video library tapes copied. ACCESS: The Education Station publishes listings of audio and video cassettes as well as a comprehensive programming schedule.

Of particular interest are the CTS videos, which are available with utilization guides. The guides outline key points in each video and suggest questions for discussion, classroom projects and other activities. Video topics are listed in the Support Learning Resources section of this guide. The videos and accompanying support material can be obtained from ACCESS: The Education Station. Refer to the Distributor Directory at the end of this section for address, telephone, fax and Internet address.

GOVERNMENT SOURCES

National Film Board of Canada (NFB)

The NFB has numerous films and videotapes that may be suitable for Career and Technology Studies strands. For a list of NFB films and videotapes indexed by title, subject and director, or for purchase of NFB films and videotapes, call 1–800–267–7710 (toll free) or Internet address: http://www.nfb.ca

ACCESS: The Education Station and some school boards have acquired duplication rights to some NFB videotapes. Please contact ACCESS: The Education Station or consult the relevant catalogues in your school or school district.

The Edmonton Public Library and the Calgary Public Library have a selection of NFB films and videotapes that can be borrowed free of charge with a Public Library borrower's card. For further information, contact:

Edmonton Public Library
Telephone: 403–496–7000

Calgary Public Library
Telephone: 403–260–2650

For further information contact:

Statistics Canada
Regional Office
8th Floor, Park Square
10001 Bellamy Hill
Edmonton, AB T5J 3B6
Telephone: 403–495–3027
Fax: 403–495–5318
Internet address: http://www.statcan.ca

Statistics Canada produces periodicals, reports, and an annual year book.

Resource Centres

Urban Resource Centres

Instructional Services
Elk Island Public Schools
2001 Sherwood Drive
Sherwood Park, AB T8A 3W7
Telephone: 403–464–8235
Fax: 403–464-8033
Internet Address: http://ei.educ.ab.ca

Learning Resources Centre
Red Deer Public School Board
4747 – 53 Street
Red Deer, AB T4N 2E6
Telephone: 403–343–8896
Fax: 403–347–8190

Instructional Materials Centre
Calgary Separate School Board
6220 Lakeview Drive SW
Calgary, AB T3E 5T1
Telephone: 403–298–1679
Fax: 403–249–3054

School, Student, Parent Services Unit
Program and Professional Support Services Sub Unit
Calgary Board of Education
3610 – 9 Street SE
Calgary, AB T2G 3C5
Telephone: 403–294–8542
Fax: 403–287–9739

After July 1, 1997, please contact the School, Student, Parent Services Unit regarding the relocation of the Loan Pool Resource Unit.

Learning Resources
Edmonton Public School Board
Centre for Education
One Kingsway Avenue
Edmonton, AB T5H 4G9
Telephone: 403–429–8387
Fax: 403–429–0625

Instructional Materials Centre
Medicine Hat School District No. 76
601 – 1 Avenue SW
Medicine Hat, AB T1A 4Y7
Telephone: 403–528–6719
Fax: 403–529–5339

Resource Centre
Edmonton Catholic Schools
St. Anthony's Teacher Centre
10425 – 84 Avenue
Edmonton, AB T6E 2H3
Telephone: 403–439–7356
Fax: 403–433–0181

Instructional Media Centre
Northern Lights School Division No. 69
Bonnyville Centralized High School
4908 – 49 Avenue
Bonnyville, AB T9N 2J7
Telephone: 403–826–3366
Fax: 403–826–2959

Regional Resource Centres

Zone 1

Zone One Regional Resource Centre
P.O. Box 6536
10020 – 101 Street
Peace River, AB T8S 1S3
Telephone: 403–624–3187
Fax: 403–624–5941

Zone 2/3

Central Alberta Media Services (CAMS)
182 Sioux Road
Sherwood Park, AB T8A 3X5
Telephone: 403–464–5540
Fax: 403–449–5326

Zone 4

Information and Development Services
Parkland Regional Library
5404 – 56 Avenue
Lacombe, AB T4L 1G1
Telephone: 403–782–3850
Fax: 403–782–4650
Internet Address: http://rtt.ab.ca.rtt/prl/prl.htm

Zone 5

South Central Alberta Resource Centre (SCARC)
Golden Hills Regional Division
435A Hwy 1
Westmount School
Strathmore, AB T0J 3H0
Telephone: 403–934–5028
Fax: 403–934–5125

Zone 6

Southern Alberta Learning Resource Centre (SALRC)
Provincial Government Administration Building
909 Third Avenue North, Room No. 120
Box 845
Lethbridge, AB T1J 3Z8
Telephone: 403–320–7807
Fax: 403–320–7817

OTHER GOVERNMENT SOURCES

Alberta Apprenticeship Program
For more information, contact the Alberta Advanced Education and Career Development office nearest you or call the Alberta Career Information Hotline. 1–800–661–3753 (toll-free) Edmonton: 422–4266

Alberta Labour
9940 - 106 Street
Edmonton, AB T5K 2N2
Telephone: 403–427–8848
Fax: 403–427–0999

Offices are also in Calgary, Camrose, Edson, Fort McMurray, Grande Prairie, Lethbridge, Medicine Hat, Red Deer and Vermilion.

Health Canada
Publications
Public Affairs, Head Office
Brooke Claxton Building
de la Colombine
Tunney's Pasture
Ottawa , ON K1A 0K9

Health Protection Branch
840, 9700 Jasper Avenue
Edmonton, AB T5J 4C3
Telephone: 403–495–2626
Fax: 403–495–2624

Or

282, 220 - 4th Avenue SE
Calgary, AB T2G 4X3
Telephone: 403–292–4650
Fax: 403–292–4644

Industry and Science Canada
Consumer Affairs
10225 -100 Avenue
Edmonton, AB T5J 0A1
Telephone: 403–495–2485
Fax: 403–495–6451

Or

301, 510 - 12 Avenue SW
Calgary, AB T2R 0H3
Telephone: 403–292–5604
Fax: 403–292–6175

PROFESSIONAL ASSOCIATIONS

The Alberta Association of Architects
10515 Saskatchewan Drive
Edmonton, AB T6E 4S1
Attention: Penny A. Cairns, Executive Director and Registrar
Telephone: 403–432–0224
Fax: 403–439–1431
http://www.aaa.ab.ca
info@aaa.ab.ca

Alberta Association of Landscape Architects
#2, 9804 - 47 Avenue
Edmonton, AB T6E 5P3
Telephone: 403–435–9902
Fax: 403–435–7503
b.hotby@ccinet.ab.ca
Attention: Bonnie Holtby, Office Manager

Alberta Professional Photographers Association
16136 - 110B Avenue
Edmonton, AB T5P 4E6
Telephone: 403–483–4275

Alberta Society of Engineering Technologists (ASET)
2100 Canada Trust Tower
10104 - 103 Avenue
Edmonton, AB T5J 0H8
Telephone: 403–425–0626
Fax: 403–424–5053
http://aset.worldgate.com
Attention: Deb Key, Volunteer Coordinator

Association of Professional Engineers, Geologist and Geophysicists of Alberta (APEGGA)
1500, 10060 Jasper Avenue
Edmonton, AB T5J 4A2
Telephone: 403–426–3990
Fax: 403–4261877
1–800–661–7020
http://www.apegga.com
Attention: Jeanne Keaschuk

Consumer's Association of Canada (Alberta)
PO Box 11171
10036 - 100 Street
Edmonton, AB T5J 3K4
Telephone: 403–426–3270
Attention: Wendy Armstrong

Interior Designers of Alberta
Box 64024
5512 - 4 Street NW
Calgary, AB T2K 6J0
Telephone: 403–274–9290
Fax: 403–274–9388

Society of Graphic Designers of Canada
Alberta Chapter
c/o Department of Art and Design
University of Alberta
Edmonton, AB T6G 2C9
Telephone: 403–492–3261
http://www.ualberta.ca/~ artdesin/

Society of Manufacturing Engineers
1 SME Drive
PO Box 930
Dearborn, MI 48121-1930
Telephone: 313–271–1500
Fax: 313–240–8255

DISTRIBUTOR DIRECTORY

The entries in the Distributor Directory are arranged alphabetically by code.

CODE	Distributor/Address	Contact Via
ACC	ACCESS: The Education Station 3270 – 76 Avenue Edmonton, AB T6B 2N9	403–440–7777 Fax: 403–440–8899 1–800–352–8293 http://www.ccinet.ab.ca/access
BH	Bacon and Hughes See LRDC *Buyers Guide* for information	
CLV	Classroom Video Unit C, 9005 Centaurus Circle Burnaby, B.C. V3J 7N4	604–420–3066 Fax: 604–420–3095 1–800–665–4121 Fax: 1–800–665–2909
GW	Gillard Welch Chester Court, High Street, Knowle, Solihull, West Midlands, England B93 0LL	01564–771772 Fax: 01564–774776
KIN	Kinetic Inc. 408 Dundas Street East Toronto, ON M5A 2A5	416–963–5979 Fax: 416–925–0653 1–800–263–6910
LRDC	Learning Resources Distributing Centre 12360 – 142 Street Edmonton, AB T5L 4X9	403–427–5775 Fax: 403–422–9750 http://ednet.edc.gov.ab.ca/lrdc
NEL	Nelson Canada See LRDC *Buyers Guide* for information	
OUP	Oxford University Press 70 Wynford Drive Don Mills, ON M3C 1J9	416–441–2941 Fax: 416–441–0345 1–800–387–8020
VEC	Visual Education Centre 41 Horner Avenue, Unit 3 Etobicoke, ON M8Z 4X4	416–252–5907 Fax: 416–251–3720 1–800–668–0749

DESIGN STUDIES

SECTION J: SAMPLE STUDENT LEARNING GUIDES

The following pages provide background information, strategies and a template for developing student learning guides. Also included at the end of this section are several sample student learning guides for Design Studies.

A student learning guide provides information and direction to help students attain the expectations defined in a specified CTS module. It is designed to be used by students under the direction of a teacher.

Many excellent student learning guides (SLGs) are available for use and/or are in the process of being developed. While Alberta Education provides a development template accompanied by some samples, most student learning guide development is being done by individuals and organizations across the province (e.g., school jurisdictions, specialist councils, post-secondary organizations). Refer to the *Career & Technology Studies Manual for Administrators, Counsellors and Teachers* (Appendix 11) for further information regarding student learning guide developers and sources.

Note: A student learning guide is not a self-contained learning package (e.g., Distance Learning Module), such as you might receive from the Alberta Distance Learning Centre (ADLC) or Distance Learning Options South (DLOS).

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BACKGROUND INFORMATION

A Student Learning Guide (SLG) is a presentation of information and direction that will help students attain the expectations defined in a specified CTS module. It is designed to be used by students under the direction of a teacher. A SLG is not a self-contained learning package such as you might receive from the Alberta Distance Learning Centre (ADLC) or Distance Learning Options South (DLOS).

Each SLG is based on curriculum and assessment standards as defined for a particular CTS module. Curriculum and assessment standards are defined in this document through:

- module and specific learner expectations (Sections D, E and F)
- assessment criteria and conditions (Sections D, E and F)
- assessment tools (Section G).

The SLG is written with the student in mind and makes sense to the student in the context of his or her CTS program. SLGs are designed to guide students through modules under the direction of the teacher. They can be used to guide:

- an entire class
- a small groups of students
- individual students.

In some instances, the Student Learning Guide may also be used as teacher lesson plans. When using SLGs as teacher lesson plans, it should be noted that they tend to be:

- learner-centred (versus teacher-directed)
- activity-based (versus lecture-based)
- resource-based (versus textbook-based).

Components of a Student Learning Guide

The student learning guide format, as developed by Alberta Education, typically has *seven* components as described below.

1. *Why Take This Module?*

   This section provides a brief rationale for the work the student will do, and also establishes a context for learning (i.e., in relation to the strand, a life pursuit, a specific industry, etc.).

2. *What Do You Need To Know Before You Start?*

   In this section, prerequisite knowledge, skills and attitudes considered necessary for success in the module are identified. Prerequisites may include other modules from within the strand or from related CTS strands, as well as generic knowledge and skills (e.g., safety competencies, the ability to measure/write/draw, prior knowledge of basic information relevant to the area of study).

3. *What Will You Know And Be Able To Do When You Finish?*

   This information must parallel and reflect the curriculum and assessment standards as defined for the module. You may find it desirable to rewrite these standards in less formal language for student use.

4. *When Should Your Work Be Done?*

   This section provides a timeline that will guide the student in planning their work. The timeline will need to reflect your program and be specific to the assignments you give your students. You may wish to include a time management chart, a list of all assignments to be completed, and instructions to the student regarding the use of a daily planner (i.e., agenda book) to organize their work.

5. *How Will Your Mark For This Module Be Determined?*

   This section will interpret the assessment criteria and conditions, assessment standards, assessment tools and suggested emphasis as defined for the module within the context of the projects/tasks completed. Accepted grading practices will then be used to determine a percentage grade for the module—a mark not less than 50% for successful completion. (**Note**: A module is "successfully completed" when the student can demonstrate ALL of the exit-level competencies or MLEs defined for the module.)

6. *Which Resources May You Use?*

   Resources considered appropriate for completing the module and learning activities are identified in this section of the guide. The resources may be available through the Learning Resources Distributing Centre (LRDC) and/or through other agencies. Some SLGs may reference a single resource, while others may reference a range of resources. Resources may include those identified in the Learning Resource Guide (Section I) as well as other sources of information considered appropriate.

7. *Activities/Worksheets*

   This section provides student-centred and activity-based projects and assignments that support the module learner expectations. When appropriately aligned with curriculum and assessment standards, successful completion of the projects and assignments will also indicate successful completion of the module.

Strategies for Developing Student Learning Guides

Prior to commencing the development of a student learning guide, teachers are advised to obtain:

- the relevant Guide to Standards and Implementation
- the student learning guide template.

Information communicated to the student in the SLG must parallel and reflect the curriculum and assessment standards as defined for the module. Therefore, critical elements of the Guide to Standards and Implementation that need to be addressed throughout the SLG include:

- module and specific learner expectations
- assessment criteria and conditions
- assessment standards
- assessment tools.

Additional ideas and activities will need to be incorporated into the student learning guide. These can be obtained by:

- reflecting on projects and assignments you have used in delivering programs in the past
- identifying human and physical resources available within the school and community
- networking and exchanging ideas (including SLGs) with other teachers
- reviewing the range of resources (e.g., print, media, software) identified in the Learning Resource Guide (Section I) for a particular module/strand.

Copyright law must also be adhered to when preparing a SLG. Further information and guidelines regarding copyright law can be obtained by referring to the:

- *Copyright Act*
- *Copyright* and the *Can Copy Agreement*.

A final task in developing a student learning guide involves validating the level of difficulty/challenge/rigour established, and making adjustments as considered appropriate.

A template for developing student learning guides, also available on the Internet, is provided in this section (see "Student Learning Guide Template," pages J.5–10). Several sample student learning guides are also provided in this section (see "Sample Student Learning Guides," starting on page J.11.

CAREER &
TECHNOLOGY
STUDIES

SAMPLE STUDENT LEARNING GUIDE TEMPLATE

WHY TAKE THIS MODULE?

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

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WHEN SHOULD YOUR WORK BE DONE?

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HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE

WHICH RESOURCES MAY YOU USE?

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ACTIVITIES/WORKSHEETS

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

Sample Student Learning Guide

DES1020 The Design Process

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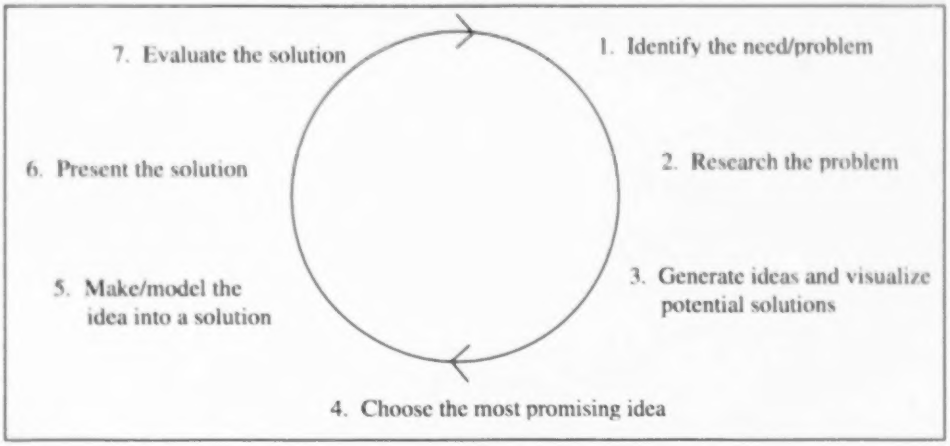
DES1020 The Design Process

WHY TAKE THIS MODULE?

Design is about solving problems. Some of these problems are given to you while other ones you find yourself. For example, you may be asked by someone else (like your Students' Council) to design a poster to advertise a school dance. On the other hand, you may give yourself the job of designing a poster to advertise a garage or yard sale you are having. In each case the problem is the same – trying to inform other people about an event. Whether the problem facing you is small or large, there is a process you will go though to solve it.

There are several different problem solving strategies that designers use but all of them have some common elements. This diagram illustrates a basic problem-solving model:


1. Identify the need/problem
2. Research the problem
3. Generate ideas and visualize potential solutions
4. Choose the most promising idea
5. Make/model the idea into a solution
6. Present the solution
7. Evaluate the solution

Designers use this type of problem-solving strategy all the time. Sometimes, if the problem is quite simple, they may skip a step or two, but they must at least think about it. For complex problems, designers may repeat steps several times as the problem is reconsidered and different alternatives are tried. It is essential for designers to be curious and not to be satisfied with their first idea or possible solution.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

There are no prerequisites identified for this module.

However, you should be comfortable in exploring new ideas and approaches to problem solving.

DES1020 The Design Process

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

Upon completion of this module you will be able to:

- identify a design process and apply it throughout the instructional period
- produce a designed solution
- select, organize and present design projects
- demonstrate basic competencies.
-

WHEN SHOULD YOUR WORK BE DONE?

You have three projects to complete during this module.

Your teacher will give you a timeline for completing tasks and assignments within this module.

You may also wish to use a time-management planning chart to preplan the work that needs to be done in this module. Plan how you will use your class time as well as extra time needed to complete the assignments in this module.

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
You must first demonstrate **all** of the competencies required for this module. When you have done this, your percentage mark for the module will be determined as follows:	
• My observation of your use of the design process during each project and the quality of your Design Journal with respect to the evidence of problem identification, research notes, ideas generated, and any additional questions and/or ideas identified during the course of the module.	60%
• Successful completion of each project: Project 1 10% Project 2 10% Project 3 10%	30%
• Presentation of each project and discussion of your work; presentation of your portfolio showing completed projects and use of the design process.	10%

WHICH RESOURCES MAY YOU USE?

- Baird, Tom. *Communicating Design* (Design and Technology in Action series). Heinemann Educational, Oxford, 1990.
- Chapman, C., and Peace, M.; Breckon, A. (Editor). *Collins CDT: Design and Realization*. Collins Educational, 1988.
- Crampton, K., and Finney, M.; Breckon, A. (Editor). *Collins CDT: Design and Communication*. Collins Educational, 1988.
- Fair, David and Kenny, Marilyn. *Design Graphics: Drawing and Presenting Your Design Ideas*. Hodder and Stoughton, 1987.
- Shadrin, Richard L. *Design and Drawing: An Applied Approach*. Davis Publications, Inc., Worchester, 1992.

ACTIVITIES/WORKSHEETS

Project 1:

Brief: WORKING PORTFOLIO

Problem: In a design class, you very quickly gather together a lot of paper and other materials, some of which you will want to keep. You will also have finished projects that must be kept safe. Design a holder (portfolio) for this material that you can use throughout your stay in Design Studies to safely keep your ideas, rough work and finished work.

Constraints:

- The portfolio must be able to contain flat work on card 56 cm × 71 cm.
- The portfolio must lie flat for storage.
- Your name must be legibly written and prominently displayed on the outside of the portfolio.

Materials:

- cardboard
- binding tape
- newsprint
- ruler
- coloured markers
- cutting tools and scissors
- design journal

Procedure:

- Study different types of containers and folders.
- Review resources for ideas.
- Develop at least three different ideas for the two-dimensional (visual) design of your portfolio.
- Try selected design in rough on newsprint.
- Try bending, folding and binding with samples of materials supplied.
- Finalize two-dimensional (visual) design, apply it to the three-dimensional design (folder) and construct the folder.
- Present project portfolio.

DES1020 The Design Process

Project 2:

Brief: PERSONAL MONOGRAM

Problem: In the middle ages, knights had their monograms emblazoned on their shields so everyone would know who they were even when they were in full armor. Today individuals and companies develop trademarks, logotypes and monograms to identify themselves or their business to others and display them on signs, business cards, vehicles, the sides of buildings, etc. Your task is to design a monogram for yourself that you could use if you started a design company.

Constraints

- use your name or your initials
- you may use only one colour and tints and/or shades of that colour.

Materials:

- newsprint
- ruler
- graphite and coloured pencils
- typography sheets
- cutting tools and scissors
- mounting materials
- design journal

Procedure:

- Study different types of logos, trade marks and monograms in books, magazines and journals.
- Identify elements and principles of design used in sample designs.
- Develop at least three different ideas for the monogram.
- Try selected design in rough on newsprint.
- Finalize design on card.
- Identify how you used design elements and principles.
- Mount finished design for presentation.
- Present project portfolio.

DES1020 The Design Process

Project 3A:

Brief: MATERIALS CONTAINER

Problem: Everyone has the need for containers to keep things in. For young children, a container is useful for keeping pencils, crayons, erasers, pencil sharpeners, felt tipped pens, paints, brushes and things that they would use for drawing, colouring and painting. You are asked to design a container that is both durable and attractive and suitable for a child who is 4 to 6 years of age.

Constraints:

- the interior volume of the container must not exceed 3,000 cubic centimeters
- if you choose to decorate the container, you may use only one colour and tints and/or shades of that colour
- a designated space must be made for the child to place his/her name on the outside of the container.

Materials:

- newsprint
- cardboard
- ruler
- graphite and coloured pencils
- coloured markers
- cutting tools and scissors
- glue
- design journal
- *wood (optional extension)*
- *plastic sheeting (optional extension)*

Procedure:

- Study different types of containers: their uses, the materials they are made from, how they are constructed, how their interior space is organized, what size they are in relationship to what they contain, etc. Note this information and any ideas you have in your design journal.
- Develop at least three different ideas for the container you are designing.
- Make a scale model (scale 1:2) of your selected design out of newsprint and revise as required.
- Make a full-sized model of your selected design out of cardboard and decorate appropriately.
- Identify elements and principles of design used in your project.
- Present project portfolio.
- *Project Extension: You may make a prototype of your container out of wood or plastic if you want; however, this would be for your own personal use and not be considered part of the project.*

Project 3B:

Brief: PENCIL HOLDER

Problem: Office Products Limited, a small office supply firm, wants to send out a promotional product to their customers. The company's owner has come up with the idea of a cardboard pencil holder that can be mailed out to her customers (flat) and then assembled by the recipient. Cost and time are both factors as this promotion will be followed in three months by a new catalogue. Yours is one of several designer firms that have been asked to submit designs for the pencil holder. You are to produce a prototype for evaluation by the company president and sales manager in two weeks time.

Constraints:

- The pencil holder laid out flat must fit within a manila envelope with the interior dimensions no larger than 22.5 cm × 30 cm.
- The company name, Office Products Limited must be visible on the holder.
- The holder must accommodate at least three standard pencils.
- No more than one colour and tints and shades of that colour may be used in addition to the colour of the cardboard.
- Approximate time required: 10 hours.

Materials:

newsprint
cardboard
graphite and coloured pencils
coloured markers
typography sheets
glue
two-sided tape
ruler
coloured markers
cutting tools and/or scissors
design journal

Procedure:

- Study a pencil and try supporting it above your desk in different ways. Conduct research into "pencil holders" and desk organizers by looking at as many different kinds as you can (at home, in stores, through books and magazines).
- Develop at least three ideas in your design journal for the shape of the pencil holder and for the graphics (lettering and colour). Support your sketches by writing down details about your ideas.
- Try bending, folding and cutting scrap cardboard into different shapes. Experiment with different ways of joining the cardboard using tabs, glue, two-sided tape.
- Select your most promising idea.
- Make a model of your design and test it with the pencils.
- Identify elements and principles of design used in your project.
- Make your prototype.
- Present project portfolio.

CAREER &
TECHNOLOGY
STUDIES

DESIGN STUDIES

SAMPLE STUDENT LEARNING GUIDE

DES1060 Drafting/Design Fundamentals

WHY TAKE THIS MODULE?

Having the ability draft out ideas so other people can understand them is very important in design. Designers often work collaboratively (together with others) on projects and therefore communication between the team members becomes very important. Well-drafted designs contribute to this communication. Also, designers need to be able to communicate their ideas to their clients, and the clients need to be able to understand the ideas being proposed and make suggestions and modifications. Again, this is communication.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

There are no prerequisites identified for this module.

However, you need to be able to look at an object (e.g., a cup, a plant, a telephone) and draw it freehand with reasonable accuracy so that a person looking at your drawing is able to identify the object, recognize its shape, form and relative dimensions and see some of the detail it possesses. *DES1010: Sketch, Draw & Model* or skills acquired through other classes such as Art will provide helpful background knowledge to work successfully in this module.

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

Upon completion of this module you will be able to:

- produce pictorial representations and multiview drawings from sketches and/or three-dimensional objects

  OR

- produce pictorial representations and surface developments for items in context; e.g., garments, sheet metal fabrication, packaging
- select, organize and present design projects
- demonstrate basic competencies.

WHEN SHOULD YOUR WORK BE DONE?

Your teacher will give you a timeline for completing tasks and assignments within this module.

You may also wish to use a time-management planning chart to preplan the work that needs to be done in this module. Plan how you will use your class time as well as extra time needed to complete the assignments in this module.

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DES1060 Drafting/Design Fundamentals

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
You must first demonstrate **all** of the competencies required for this module. When you have done this, your percentage mark for the module will be determined as follows.	
• Successful completion of each exercise and project: Exercises and test 20% Project 1 20% Project 2 20% Project 3A 30% or Project 3B 90%	90%
• Presentation of projects and discussion of your work testing general understanding; of drafting terminology, procedures, conventions, etc.	10%

WHICH RESOURCES MAY YOU USE?

- Baird, Tom. *Communicating Design* (Design and Technology in Action series). Heinemann Educational, Oxford, 1990.
- Crampton, K., and Finney, M.; Breckon, A. (Editor). *Collins CDT: Design and Communication*. Collins Educational, 1988.
- Fair, David and Kenny, Marilyn. *Design Graphics: Drawing and Presenting Your Design Ideas*. Hodder and Stoughton, 1987.
- Hepler, D. E., Wallach, P. R. and Hepler D. J. *Architecture, Drafting and Design*, 6th Edition, Glencoe/McGraw-Hill, 1991.
- Kicklighter, C. E., Baird, R. J. and Kicklighter, J. C. *Architecture: Residential Drawing and Design*. The Goodheart-Willcox Company, Inc., 1995.
- Walker, J. R. *Exploring Drafting: Fundamentals of Technology*. The Goodheart-Willcox Company, Inc., 1996.

ACTIVITIES/WORKSHEETS

Exercise 1: **Pictorial Drawing**

- Select an object from those provided to you and use it as a reference of each of the drawings. You will be lead through each of the drawings.
- Produce *one of each* of the following drawings using a pencil and ruler:
  - isometric
  - oblique
  - one-point perspective
  - two-point perspective.
- Produce *one* of the following drawings using a pencil and drawing grid:
  - isometric
  - oblique.
- Produce *one* of the following drawings using a T-square, 30, 60, 90 set square and circle and ellipse templates:
  - isometric OR
  - oblique
  - one-point perspective
  - two-point perspective.
- Note: Use your Design Journal to keep notes.

DES1060 Drafting/Design Fundamentals

Project 1: **Isometric and Oblique Drawings**

Brief: OFFICE DESK

Problem: A desk manufacturer is putting out a catalogue of its products. One of these products will be a new line of double pedestal office desks made of metal with wooden veneer on the drawers and top. You have been provided with plans for the desk, and a sketch of what it will look like when assembled. Your job is to produce and isometric drawing or a cabinet oblique drawing of the desk that can be used as an illustration of the product in the new catalogue.

Constraints:
- **Drawing must be completed on a sheet with dimensions (21.5 cm × 28 cm).**

Materials:
- drawing paper (21.5 cm × 28 cm)
- pencil
- eraser
- ruler
- T-square
- 30, 60, 90 set square
- Design journal

Procedure:
- Study the dimensioned plan and sketch you are provided with.
- Draw desk with pencil using "light" lines.
- Indicate texture on veneered portions of desk.
- Darken in lines where appropriate.
- Finish drawing.
- Place drawing in portfolio.

DES1060 Drafting/Design Fundamentals

Project 2: **One- and Two- point Perspective Drawing**

Brief: MEGABLOCKS

Problem: Toys For Tots is a major Canadian toy manufacturer. They specialize in making toys for children ages four and under. A new product line "MEGABLOCKS" has recently been designed and will be available to customers early next year. "MEGABLOCKS" are large colourful blocks of lightweight foam that come in cubes, cylinders, triangular prisms, cones and pyramids. The dimensions of each cube are 30 cm × 30 cm × 30 cm with the other forms not exceeding this size. They can be stacked by children in different ways to produce towers, walls, chairs, etc.

The company has asked you to diagram each of the forms in one-point and two-point perspective and to draw a composition of the blocks in an arrangement a typical four-year-old child might make. The composition may be done using one- or two-point perspective. Three presentation drawings will be required.

Constraints:

- Drawing must be completed on a sheet of cartridge paper.
- The drawing must be done in pencil.
- Cast shadows and highlights may be included (optional).

Materials:

- cartridge paper
- pencil
- eraser
- ruler
- design journal
- sample reference forms (e.g., cone, cube, cylinder)

Procedure:

- Study the different forms from various angles and experiment with the different forms in various lighting conditions.
- Prepare line drawings of each form using one- and two-point perspective.
- Using either one- or two-point perspective, compose forms on a page as a four-year-old child might arrange them when playing.
- Finish drawing.
- Mount perspective drawings and isometric or oblique drawing.
- Present drawing portfolio.

DES1060 Drafting/Design Fundamentals

Exercise 2: Multiview Drawings

- Select an object from those provided to you and use it as a reference of each of the drawings. I will lead you through each of the drawings.
- Produce the following drawings using a pencil, ruler, T-square and set square:
  - border and title block
  - front view
  - top view
  - side view.
- Dimension the drawings produced and add information to title block.
- Using isometric grid paper, produce a pictorial representation of the object represented by the multiview drawing.
- Note: Use your Design Journal to keep notes.

Exercise 3: Surface Developments

- Examine several flat patterns; e.g., cereal box, tissue box, french fry container, clothing pattern.
- Develop a simple pattern shape:
  - sides, top, bottom
  - add tabs and seams, bending lines
  - cut out and fold together.
- Using card stock, try scoring card on a curved line and then bend into shape.
- Note: Use your Design Journal to keep notes.

DES1060 Drafting/Design Fundamentals

Project 3A: **Multiview Drawing**

Brief: GO-GO CAR

Problem: Toys For Tots is a major Canadian toy manufacturer. They specialize in making toys for children ages four and under. Market research done by the company suggests that there is a need for a children's riding toy made of colourful plastic for children with an average age of three years. This new toy called the "GO-GO car" will go into production early next year. "GO-GO car" will be designed using basic forms (e. g., cube, cylinder, triangular prism, cone and pyramid) and will be sold in a colourful cardboard box with the outside dimensions of 70 cm × 40 cm × 40 cm.

The company has asked you to do basic working drawings for the "GO-GO car" including a front view, side view, top view and a pictorial representation using isometric projection. The completed drawings should be composed for presentation on one presentation sheet.

Constraints:

- Composition dimensions are 43 cm × 56 cm.
- Three views must be completed in pencil.
- Pictorial representation must indicate tone (colour is optional).
- Border and title block must be included.
- Manufacture, product name, your name, date drawn and scale of drawing must be included in title block information.

Materials:

- cartridge paper and/or vellum
- pencil
- eraser
- ruler
- isometric graph paper
- T-square
- 30, 60, 90 set square
- design journal
- coloured pencils (optional)
- sample "GO-GO car" (may be used for reference)

Procedure:

- Carefully examine the sample "GO-GO car" or sketches and dimensioning information provided.
- Select an appropriate scale in which to produce your drawings.
- Produce a front view, top view and side view.
- Prepare an isometric projection of the product.
- Finish drawings.
- Present drawing portfolio.

Project 3B: **Surface Development**

Brief: Box of Cookies

Brief: Dog House Pet Food Corporation has developed a pet treat that they will market to dog owners attending dog shows. The new product is to be called Dawg Cookies. The company president wants a package developed to help market the new Dawg Cookies.

Constraints: This package will be made out of heavy card, stamped or cut out of a flat sheet and then shipped to the packaging department for assembly, filling and distribution. The president has asked that a package be designed in the shape of a dog house and that the package have a carrying handle. Buyers will open the top of the package to access the Dawg Cookies.

The package must be made to the following specifications:

- volume = 1500 cubic centimeters (approximate)
- height = 10 centimeters
- width = 10 centimeters
- length = 15 centimeters
- include tabs to allow fastening edges together
- carrying handle must be part of the package, not an added component
- package must display the produce name at least once

Materials:

- newsprint and/or cartridge paper and/or vellum
- card stock for model
- pencil
- eraser
- ruler
- scissors and/or knife
- T-square
- 30, 60, 90 set square
- design journal
- coloured pencils (optional)
- sample package from commercial sources (may be used as reference)

Procedure:

- Sketch out a basic design on light gauge paper, cut out and fold together to test shape, size, placement, etc.
- Produce surface development drawing on light gauge paper.
- Draw in product name on package.
- Transfer finished drawing to card.
- Complete drawing of product name on card.
- Cut out package from card and fold along bending lines.
- Fasten package together to produce model.
- Present as part of portfolio.

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

SAMPLE STUDENT LEARNING GUIDE

DES3070 Living Environment Studio 1
DES3080 Living Environment Studio 2
DES3090 Living Environment Studio 3

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WHY TAKE THIS MODULE?

Designers who work in architecture, interior and environmental design must consider many factors as they design living spaces for their clients. The needs of the clients will vary depending on the intended outcome. For example, a person who owns a restaurant and wants to design its interior will require an outcome that will be aesthetically pleasing so customers will be attracted to the restaurant and feel comfortable once they arrive. This person will also want a design that is functional, easy to maintain and durable because it will need to serve many people over a long period of time. Some of these same qualities will also be required in this person's home, although the home design will be quite different from that of the restaurant. Similarly, this person and their family will also spend time in other environments such as public parks and will require a variety of services from the park(s) they go to.

As a group being given the task of designing a living environment, you must consider the needs of human beings, the needs of the environment, the aesthetic and functional quality of your designs, the best materials to use to produce the design and how the final product can best be produced either singly or in quantity. Throughout integrated project, you and/or your group will make decisions and answer questions pertaining to the design of a living environment for human use. Good luck.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

There are no prerequisites identified for this module.

To be successful in this integrated project you will need to be able to work as a member of a design group and use a design process. You will need to conduct research and use your findings to develop new solutions.

Completion of *DES2040: Drafting/Design Applications* and either *DES2010: 2-D Design Applications* or *DES2020: 3-D Design Applications* will provide helpful background knowledge to work successfully in this module.

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WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

Upon completion of this module you will be able to:

- produce creative designed solutions based in architectural, environmental and/or interior design, that address human and/or environmental needs
- use elements, principles and processes of design to deal with identified human and/or environmental needs within design solutions
- describe how human and environmental requirements affect design
- produce advanced level designed solutions for problems in one or more living environment themes: architectural design, environmental design, interior design
- apply elements and principles of design: e.g., space, form, and ergonomics within architectural, environmental, and/or interior design
- make rational judgements with respect to aesthetic quality in architectural, environmental or interior design
- use appropriate materials and production processes to resolve set design problems
- identify materials and products used in architectural, environmental and/or interior design, and give reasons for their use based on their properties
- identify and/or specify production processes, and/or methods of manufacturing products common to architectural, environmental and/or interior design
- select, organize and present design projects
- demonstrate basic competencies.

WHEN SHOULD YOUR WORK BE DONE?

Your teacher will give you a timeline for completing tasks and assignments within this module.

You may also wish to use a time-management planning chart to preplan the work that needs to be done in this module. Plan how you will use your class time as well as extra time needed to complete the assignments in this module.

11
12
1
10
2
9
3
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5

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HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
You must first demonstrate **all** of the competencies required for this module. When you have done this, your percentage mark for the module will be determined as follows.	
• Successful completion of project.	80%
• Presentation of project and discussion of your work.	20%

WHICH RESOURCES MAY YOU USE?

- Ching, Francis D. K. *Interior Design Illustrated*. Van Nostrand Reinhold, New York, 1987.
- Foundation for the Advancement of Science and Education (PBS). *Future Habitats* (Futures 2 series), 1992. Distributed by Visual Education Centre (VEC).
- Foundation for the Advancement of Science and Education (PBS). *Graphic Design* (Futures 2 series), 1992. Distributed by Visual Education Centre (VEC).
- Foundation for the Advancement of Science and Education (PBS). *Industrial Design* (Futures 2 series), 1992. Distributed by Visual Education Centre (VEC).
- Hepler, Donald E., Wallach, Paul R. and Hepler, Dana J. *Architecture Drafting and Design*. 6th Edition. Glencoe/McGraw-Hill, 1991.
- Kicklighter, Clois E., Baird, Ronald J. and Kicklighter, Joan C. *Architecture: Residential Drawing and Design*. The Goodheart-Willcox Company, Inc., South Holland, Illinois, 1995.
- Kilmer, Rosemary and Otie Kilmer. *Designing Interiors*. Orlando, Florida: Harcourt, Brace, Jovanovich, 1992.
- Shadrin, Richard L. *Design and Drawing: An Applied Approach*. Davis Publications, Inc., Worchester, 1992.

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ACTIVITIES/WORKSHEETS

Project: **Architectural Design**

Choose *one* of the following projects:

Brief 1: Design a lunar community suitable for continuously sustaining life on the Earth's moon.

Brief 2: Design a condominium complex for seniors.

Brief 3: Design your dream house.

Brief 4: Design a Velodrome for the Olympic Summer Games of 2004.

Brief 5: Design the Information Centre of a wildlife theme park.

Project: **Environmental Design**

Choose *one* of the following projects:

Brief 6: Design an inner city public park of no less than 5 hectares.

Brief 7: Design an aviary for a local zoo.

Brief 8: Design a coastal fish farm.

Brief 9: Design a space station.

Brief 10: Design a sterile environment for a hospital emergency ward.

Project: **Interior Design**

Choose *one* of the following projects:

Brief 11: Design the interior of a day care centre.

Brief 12: Design the interior of a coffee house and deli.

Brief 13: Design the interior of a veterinarian's clinic.

Brief 14: Design the interior of a one-bedroom apartment.

Brief 15: Design the interior of an underwater research station.

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Design Briefs: Architectural Design

Brief 1: LUNAR COLONY

Problem: It is the year 2010 and the first lunar colony is being planned by an international space exploration consortium. The Canadian Space Agency as a member of that consortium has asked for design proposals. Your architectural design group has agreed to submit a proposal in the form of scale drawings, a scale model and a prospectus describing:

- the components
- the materials to be used
- where the components would be manufactured
- how the components would be transported
- how the colony would be assembled on the moon
- how the features of your design will meet the needs of colonists.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

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Brief 2: SENIORS' CONDOMINIUMS

Problem: Your architectural design group is bidding on an adult condominium complex for seniors. The complex is to have 40 separate residences, a community/recreation, and a manager's office. As some of the prospective residents may be disabled, wheelchair access to all facilities is required. The building site is in a suburban community supported by all utilities and by public transportation. A project proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:

- the components of the condominium complex
- the materials to be used
- how the features of your design will meet the general needs of the residents
- features of your design which are unique and how these will benefit the residents
- why your design proposal should be selected.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

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Brief 3: DREAM HOUSE

Problem: You have won three million dollars in the 649 lottery. You have decided to design and build the house of your dreams. The house may be located in an urban or rural setting. Total cost of property acquisition, utilities installation and house construction must not exceed one million dollars (Canadian).

The local land development board requires the following which you must provide before and development or construction can begin:

- a site plan showing utilities access
- a floor plan of the house
- front and side elevations
- plumbing, heating and electrical diagram
- a prospectus describing the house and its significant features which will have an impact on the building permit (e.g., fireplace, hot tub, pool, sauna, solarium).

Constraints:

- Drawings must be completed on vellum.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience.

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Brief 4: OLYMPIC VELODROME

Problem: A major Alberta centre is submitting a request to host the 2004 Olympic Summer Games. Part of the submission includes drawings, diagrams and/or models of proposed venues. Your design group has been asked to submit a design for the Velodrome, a new cycling facility to be constructed in a rolling, park-like setting on the western outskirts of the city. A project proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:

- the components of the Velodrome complex
- how the complex will relate to and take advantage of the surrounding natural features
- how contestants and spectators will be able to access the site, the competition area and the viewing area
- public facilities such as food concessions, washrooms, parking
- why your design proposal should be selected.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modeliing construction procedures with your teacher prior to using them.

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Brief 5: INFORMATION CENTRE

Problem: Kananaskis Country is a major recreation area of Albertans and also attracts visitors from around the world. It is characterized by beautiful scenery and abundant wildlife. A new Information Centre is required that will serve tourists on a year around basis. Your design group is asked to submit a design proposal for the Centre. The proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:

- the components of the Information Centre
- how the Centre will relate to and take advantage of the surrounding natural features
- how staff will be accommodated
- public facilities such as food concession, washrooms, parking
- any special features (e.g., adjacent trails, emergency facilities, interpretive information centres)
- why your design proposal should be selected.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Design Briefs: Environmental Design

Brief 6: INNER CITY PARK

Problem: As part of the revitalization of the core of a major Canadian city, planners have proposed the development of a park that would serve the public throughout the year. The proposed site has an area of 5 hectares, is bordered on two sides by a shallow canal frequented by boaters in the summer and has a monument to Canada's veterans (which cannot be moved) within its boundaries. A call for proposals has been made and your design group has been asked to prepare a design for the park. The proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:

- the parks major features
- how the park will relate to and take advantage of the surrounding natural and previously built features
- the kind of use the park is likely to receive at different times of the day and in different seasons
- playgrounds
- any special features (e.g., fountains, sports fields, performing arts centres)
- why your design proposal should be selected.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

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Brief 7: ZOO AVIARY

Problem: A zoo has received a donation of five million dollars from a wealthy benefactor and bird fancier for the purpose of building and stocking an aviary. The building will be attached to an existing single storey structure used for zoo administration and containing a small restaurant. You are to design the aviary and submit concept drawings and a model of the facility to the zoo's board of directors at their next board meeting scheduled in eleven weeks. You must also submit a prospectus describing:

- the assortment of birds that would be housed in the facility
- how the facility will safely accommodate the birds
- how visitors will be able to circulate through the aviary so they can see the birds
- how the aviary will relate to and take advantage of the surrounding natural and previously built features
- the kind of use the aviary is likely to receive at different times of the day and in different seasons
- public facilities such as washrooms
- any special features (e.g., fountains, plant life, theme areas such as different climatic zones)
- why your design proposal should be selected.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

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Brief 8: COASTAL FISH FARM

Problem: An opportunity has come your way to join a partnership that is establishing a commercial fish farm located in a sheltered inlet on the east coast of Vancouver Island, British Columbia. Indigenous varieties of fish will be raised in pens and shipped to market in Nanaimo. You are to design the farm including the pens, feed storage, office space and personal lodging for the farm manager. You must also submit a prospectus to your business partners describing:

- the assortment of fish to be raised in the facility
- how the fish farm will operate
- market potential
- potential environmental impact of the farm on the surrounding waters and land and the potential impact of these on the farm
- any special features (e.g., fish feeding or harvesting equipment, storage facilities)
- why your partners should support your design.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 9: SPACE STATION

Problem: The Canadian Space Agency as a member of an international space exploration consortium has asked for design proposals for a space station designed to orbit the Earth and act as a scientific research facility and a staging facility for space exploration and development. Your design group has agreed to submit a proposal that would describe the living conditions of the people assigned to the station and how these would be accommodated. The submission would take the form of scale drawings, a scale model and a prospectus describing:

- provision of day-to-day living needs
- recreation facilities
- work facilities
- power sources
- heating mechanisms
- water production
- food production
- waste removal
- storage and maintenance.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 10: STERILE ENVIRONMENT

Problem: A hospital serves a community that has a strong industrial and manufacturing base. Some of this industry uses toxic and corrosive materials in their work. Should an accident occur, there is a possibility that workers will be contaminated by some of this material and require immediate hospital treatment in a sterile environment. Your design group has been given the task of designing a self-contained sterile environment capable of holding up to five patients at one time. Medical and support personnel must have access to the environment to administer medical treatment and perform other necessary functions. The submission would take the form of scale drawings, a scale model and a prospectus describing:

- provision of patient's medical needs
- provision of patient's day-to-day living needs
- access for medical and non-medical personnel
- how the environment will be controlled
- emergency back up resources (e.g., power, heat, water)
- storage and maintenance.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Design Briefs: Interior Design

Brief 11: DAY CARE CENTRE

Problem: Just Like Home Day Care is expanding by opening a second day care in the same community. A suitable location has been found in a strip mall. The space has an area of 200 square metres on one level with an outside door leading to a grassy area that could be converted to a playground. Your design group must develop a floor plan for the building space and design the interior appropriately. Necessary components will include three separate spaces for groups of children, office space for the administration of the day care, a reception area, signage for the entrance and a plot plan for the playground area. Please submit scale drawings and a scale model of the facility and a prospectus describing:

- materials required to create an interior design for the day care
- particular features of the facility that would make it attractive to the children and their parents
- features that would help the staff in doing their job
- how standards are met or facilitated by the design.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 12: COFFEE HOUSE AND DELI

Problem: The Fine Food Emporium is well-established restaurant serving a standard menu of dishes to long-time customers. The opportunity has arisen to expand the business into the adjacent business and the owners have decided to open a specialty coffee house and deli. This new space is located on a busy southwest corner with a wide sidewalk on the south side. Your design group is to design the facility and the decor for this business and to suggest a business name based on the decor theme. Please submit scale drawings and a scale model of the facility and a prospectus describing:

- materials required to create an interior design for the business
- particular features of the business that would make it attractive to potential clients
- features that would help the staff in doing their job.
- how the environment will relate to the existing restaurant.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 13: VETERINARY CLINIC

Problem: The local animal hospital is slated for replacement in five months. The new facility will have a reception area, office, examination rooms, small animal surgery, large animal surgery, kennel and large animal holding area. Your design group is part of an architectural and engineering firm that has been selected to design the clinic. Your job is to design the decor for the reception area, office area, examination rooms and surgeries. Please submit scale drawings and a scale model of the facility and a prospectus describing:

- materials required to create an interior design for each area
- features that would help the staff in doing their job
- features that would increase the comfort and speed the recovery of the animals being cared for.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 14: A LOFTY APARTMENT

Problem: You are moving out for the first time. You have found in an old house a loft that can be converted into an apartment. It has sloped ceilings and two windows, one at each end of the space. The owner (your aunt) says that you can convert the loft into an apartment as long as you pay for the materials and pay for or do the work yourself. She will give you free rent for six months in exchange for your design and construction work.

Design the apartment to suit yourself. Please submit scale drawings and a scale model of the facility and a prospectus describing:
- materials required to create the design
- particular features that make the apartment your own.

Constraints:
- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

DES3070 Living Environment Studio 1, DES3080 Living Environment Studio 2, DES3090 Living Environment Studio 3

Brief 15: UNDERWATER RESEARCH STATION

Problem: Underwater Research and Development has been awarded a contract to design and build an underwater research station that will be submerged in the Lake Huron to test how people adapt to life in an underwater environment. The station will have room for 10 people and contain separate living and working spaces. Your design group must submit a proposal that would describe the living conditions of the people assigned to the station make recommendations with respect to the interior design of the station and how this could enhance the quality of their existence. The submission would take the form of scale drawings, a scale model and a prospectus describing:

- the decor of the living and working areas
- recreation facilities
- how specific features of the design would enhance the living and working conditions.

Constraints:

- Drawings must be completed on vellum.
- The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

K. ACKNOWLEDGEMENTS

The Design Studies strand was developed through the cooperative effort of people from schools, post-secondary institutions, professional associations, business, industry, labour, and departments and agencies of the Government of Alberta. Alberta Education would like to extend sincere appreciation to the following individuals and groups.

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